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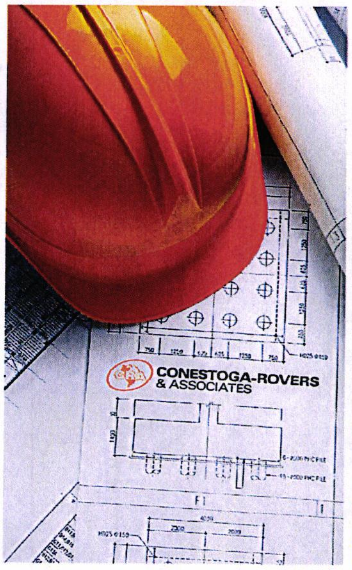

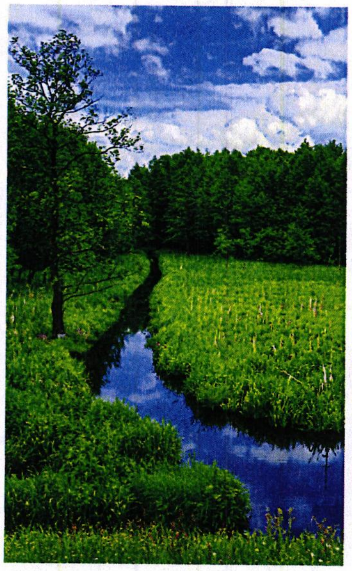

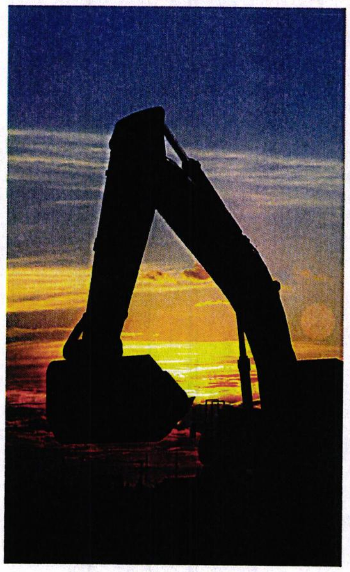

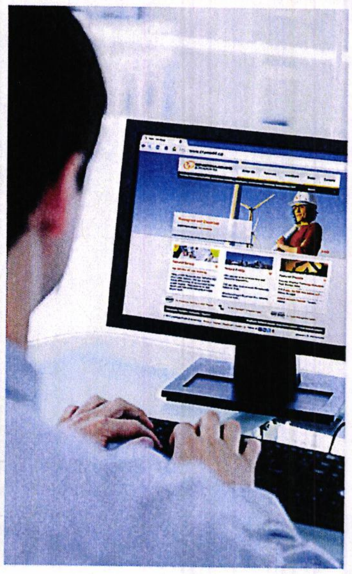

Phase II On-Site Groundwater RCRA Facility Investigation Supplemental Report

Occidental Chemical Corporation
Wichita, Kansas

EPA ID # KSD007482029

Prepared for: Glenn Springs Holdings, Inc.

Conestoga-Rovers & Associates
8615 W. Bryn Mawr Avenue
Chicago, Illinois 60631

June 2014 • 054046 • Report No. 47

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June 19, 2014

Reference No. 054046

Mr. Bradley Roberts
U.S. Environmental Protection Agency, Region 7
Air and Waste Management Division
RCRA Corrective Action & Permits Branch
901 N. Fifth Street
Kansas City, Kansas 66101

RECEIVED
JUN 20 2014
AWMD/WRAP-KNRP

Dear Mr. Roberts:

Re: Response to U.S. EPA's Comments
Phase II On-Site Groundwater Investigation RFI Summary Report
Occidental Chemical Corporation, 6200 S. Ridge Road, Wichita, Kansas
RCRA ID #KSD007482029

Conestoga-Rovers & Associates (CRA), on behalf of Occidental Chemical Corporation (OCC), has prepared responses to the United States Environmental Protection Agency (U.S. EPA) comments detailed in your letter dated May 16, 2014. For ease of your review, U.S. EPA's comments are reiterated below in italic print, followed by CRA's response.

General Comment 1.

First a general comment on the report: This report discusses a considerable amount of data collected for this site, but Occidental must attempt to associate each indication of contamination with a particular release (or general release scenario) making sure that release is characterized to the extent practical, even if the release is not thought to be from a particular AOC/SWMU. In multiple cases, sample results above Occidental's calculated background concentrations received no further discussion, except for clarifying that the SWMU didn't handle waste of that type.

Response

Agreed. CRA has prepared the attached supplement to the Phase II On-Site Groundwater Investigation RFI Summary Report (Phase II On-Site Groundwater RCRA Facility Investigation Supplemental Report (Supplemental Phase II Report)) which associates identified contamination with a particular release (or general release scenario). It is noted; however, that many of the identified potential associations are qualitative with respect to a general release scenario in that releases occurring prior to the Facility's successful 1977 Waste Management Plan improvements were not extensively documented. In addition, the Supplemental Phase II Report further evaluates sample results above the screening criteria established by the Phase II Report, namely the soil saturation limit (Csat) and established background concentrations. OK

Comment No. 1

Section 2.5: The conceptual site model discusses the hydrogeologic setting, but does not discuss the chemical release scenario in terms of the nature, locations, and magnitudes of releases, or the fate and transport of contamination. A conceptual site model should also discuss exposure scenarios with respect to current and future land use. Please provide a discussion on these aspects of the conceptual site model.

Response

Agreed. Chemical release scenarios and exposure scenarios for current and future land users are provided in the attached Supplemental Phase II Report.

Comment No. 2

Section 4.3: As Occidental has now studied the DNAPL occurrence at this site. To the extent possible, estimate the mass of DNAPL, as well as other forms of contamination, present.

Response

DNAPL can occur as immobile ganglia, fingers, and blebs at residual saturation in coarse-grained porous media or as pools on tops of low-permeability layers. The complex distribution of DNAPL in the subsurface is also referred to as the entrapment architecture. Although pools of DNAPL can contain a significant mass of contaminants, residual DNAPL often has a greater contribution to downgradient groundwater concentrations due to the much larger surface area of groundwater contact. In fact, hydrogeology, biogeochemistry, and DNAPL entrapment architecture, and not total DNAPL mass, control many of the most important parameters involved in mass fate and transport (e.g., source and plume longevity, plume length, etc.).

The mass of DNAPL at the Site cannot be reliably estimated due to the complex contaminant distribution in the subsurface and other complicating factors related to geology, release and transport mechanisms, and differential weathering. DNAPLs preferentially move through zones with the highest permeability, which may only take up a small fraction of the aquifer matrix. DNAPL can also enter low permeability zones (e.g., silt and clay units) through fractures and other secondary porosity features (e.g., roots, worm casts, or animal borings).

The entrapment architecture creates many challenges for site remediation because of the difficulty in locating and treating the DNAPL, which is described in the EPA Groundwater Issue: Assessment and Delineation of DNAPL Source Zones at Hazardous Waste Sites:

> *"Given the selective nature of DNAPL migration, it is not feasible to determine the exact location and extent of individual DNAPL migration pathways within the overall confines of the source zone in either unconsolidated deposits, or fractured bedrock" (Kueper & Davies, 2009, p. 8).*

Several researchers have attempted to quantify the error associated with mass estimation of DNAPL sources. Even under controlled laboratory conditions where a known mass is added, mass estimates can very over several orders of magnitude, depending on the spatial sampling interval on which the estimate is based. While, high-density sampling can be used to gain insight into the mass flux from a system, sampling intervals larger than a fraction of a centimeter vertically and horizontally may result in large variations in mass estimates, potentially orders of magnitude. Such estimates, if they were possible, yield little useful information, such as an indication of the longevity of the mass flux or the steady-state plume length. As mentioned above, much more important is the DNAPL architecture, which is site-specific and which also cannot easily be measured directly. A valuable surrogate to estimate important information for site decision-making is mass flux, which has been the focus of recent research - to the exclusion of DNAPL mass estimates.

Additional characterization details are provided in the attached Supplemental Phase II Report.

Comment No. 3

Figure 24. This figure focuses on AOC and SWMU evaluations and is useful. Another important output from the RFI should be a description and corresponding diagram of releases that either correspond with AOCs/SWMUs or are independent. Such discussion/figure should accompany and complement the conceptual site model.

Response

Additional figures and discussion expanding the information provided on Figure 24 and provided in response to General Comment 1 are incorporated into the Supplemental Phase II Report. Specifically, the Supplemental Phase II Report includes figures for each of the SWMUs and sampling points that were found to exceed the screening criteria established in the Phase II Report. Pertinent data and other information are shown on each of the detailed figures.

Comment No. 4

Section 5.2.1.6: This discussion concludes that in the Penta Accumulation Storage Area, even though multiple compounds were detected in soil borings above Occidental's calculated background concentrations, only the detection of pentachlorophenol causes Occidental to retain this SWMU for further study. It is also necessary to discern from where the 2,4-dichlorophenol, benzene, and alpha-BHC, which were also detected in soil samples proximate to this SWMU, were released including, to the extent possible, location and volume of release(s).

Response

As indicated by the Phase II Supplemental Report: several soil samples collected in the vicinity of the Penta Accumulation Storage Area and Sump 425 exceeded the area-specific background concentrations. Moreover, but as indicated on Figure 4 of the Supplemental Phase II Report, alpha-BHC, benzene, 2,4-dichlorophenol, and pentachlorophenol were detected in soil samples (at PA-52) at concentrations exceeding their respective area background values. The pentachlorophenol and 2,4-dichlorophenol detected in shallow soil are consistent with surface spills in or near the "Penta Accumulation Storage Area" SWMU. The presence of alpha-BHC and benzene (at PA-52) are consistent with historical operations associated with the outdoor BHC product storage pile which, during the 1950s and early 1960s, occupied the area where the maintenance building is today. These releases likely occurred prior to the paving of this area.

2,4-Dichlorophenol (at PA-53) was detected in shallow soil (3-5 feet bgs) at concentrations exceeding area background in the vicinity of the "Sump 425" SWMU. Due to the shallow depth of the 2,4-dichlorophenol in boring PA-53, a leak from the base of the sump is not indicated. The 2,4-dichlorophenol concentrations may be consistent with a surface spill near the sump, a sump overflow, or leaks in shallow piping entering the sump (e.g., trench drains).

Comment No. 5

Section 5.2.2.5: As with a number of other SWMUs discussed in this report, Sump 446 is listed as having "no indication of a release" even though hexachlorobenzene concentrations in the associated soil sample were above Occidental's calculated background concentrations for the area. As mentioned elsewhere in this letter, it will be important for Occidental to integrate the presence of the identified contamination into the conceptual site model to develop a clear description of the contamination scenario of this site, so that proposed remedies in the future corrective measures study are focused, to the extent possible, not on SWMUs retained for further study, but on identified releases of contamination.

Response

This location (IA-56) is evaluated in the Supplemental Phase II Report, which concludes that the detection may have originated from possible runoff from the Penta Area to the north. Location IA-56 is recommended for no further action because the hexachlorobenzene concentration (0.74 mg/kg) is below the industrial RSL of 1.1 mg/kg and is located beneath concrete.

Comment No. 6

Section 5.2.2.7: For the detections over Occidental's calculated background concentrations in non AOC/SWMU areas, the report states the identified contamination will be subject to further evaluation in the CMS. The report does not indicate what kind of further evaluation will be *performed, but it seems the referenced evaluation should be completed in the RFI stage, so that the nature and extent is fully defined prior to entering the CMS stage.*

Response

Agreed. Further evaluation of the locations identified in Sections 5.2.1.11 and 5.2.2.7 (Non-AOC/SWMU Locations) are discussed in the Supplemental Phase II Report. These locations are:

- Organics Area
    - location AR-07 – 1,1,1-trichloroethane
    - location CM-25 - 1,2-dichloroethane and 1,2-dichloropropane
    - location CM-43 – perchloroethylene (Csat exceedence)
    - location PA-38 - 1,1,1-trichloroethane
    - location PA-52 - alpha-BHC and benzene
    - location SO-5 – benzene
- Inorganics Area
    - location IA-03 - trichloroethene
    - location IA-13 - trichloroethene
    - location IA-19 - beta-BHC
    - location IA-50 - carbon tetrachloride
    - location IA-56 - hexachlorobenzene

Comment No. 7

Table 8: For former Interceptor Wells 26, 32 (old), 33, 34, 35 and Interceptor Wells 30, 31, & 32 (new) it is not clear whether there is an indication of a release since the last column of the table is blank (if no soil samples were collected, provide a footnote to the table). Please provide clarification in the table.

Response

A revised Table 8 with clarification is provided in the Phase II report supplement.

CONESTOGA-ROVERS
& ASSOCIATES

If you have any questions regarding these comments, please do not hesitate to contact me at (773) 380 9234 or Juan Somoano at (972) 687-7510.

Yours truly,

CONESTOGA ROVERS & ASSOCIATES

B. Clegg

Bruce Clegg

BCC/ko/15
Encl.

cc: Mostafa Kamal - KDHE
Juan Somoano – Glenn Springs Holdings, Inc.

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Section 1.0 Introduction

This report provides additional information and analysis to supplement the Phase I and II On-Site Groundwater Investigation RCRA Facility Investigation (RFI) Summary Reports (CRA, 2013) (CRA, 2014) (Phase I and II Reports, respectively). Specifically, this supplement includes an evaluation of potential release mechanisms and an exposure pathway analysis. This supplemental report was developed to specifically respond to the U.S. Environmental Protection Agency's (U.S. EPA's) May 16, 2014 comments (Roberts, 2014) to the Phase II Report.

Section 2.0 Data Evaluation

This section associates each indication of contamination that was observed above the soil saturation limit (Csat) and/or area background with a particular release (or general release scenario) to ensure that the release is characterized to the extent practical, even if the release is not understood to originate from a particular Area of Concern (AOC) or Solid Waste Management Unit (SWMU). The AOCs and SWMUs are listed in Table 1. Analytical results were compared with the screening criteria described in the Phase II Report (CRA, 2014, pp. 28, Table 6). The SWMUs and other locations which were originally identified as exceeding screening criteria in the Phase II Report are shown on Figure 1.

2.1. Organics Area

The Organics Area contains 14 SWMUs and other locations that were specifically identified by the Phase II Report. These locations are described in detail below.

2.1.1. Former Hex Pit Area

Soil samples collected in the general vicinity of the "Former Hex Pit Area" SWMU (AR-1, AR-2, CM-47, CM-48, CM-49, CM-55, CM-57, CM-63, CM-64, CM-65, DB-02, DB-03, DB-04, DB-07, and DB-17) exceeded Csat for hexachlorobutadiene, hexachlorobenzene, hexachloroethane, perchloroethylene, or carbon tetrachloride. These sample results are shown on Figure 2. These Csat exceedences correspond to the location of the "Former Hex Pit Area" SWMU described in the Phase II Report.

The various indications of Hex DNAPL are consistent with downward and subsequent lateral migration of the DNAPL which was temporarily stored in these earthen pits.

2.1.1. Former Northwest Hex Waste Quench Pit

Figure 3 illustrates investigative locations in the vicinity of the Former Northwestern Hex Waste Quench Pit. As was identified in the Phase II Report (Figures 20 – 23), a DNAPL body with primary constituents composed of hexachlorinated compounds are present in this area. The indications of Hex DNAPL are consistent with downward and subsequent lateral migration of the DNAPL which was temporarily stored in this earthen pit.

2.1.1. Penta Accumulation Storage Area, Sump 425, and Location PA-52

Several soil samples collected in the vicinity of the Penta Accumulation Storage Area and Sump 425 exceeded the area-specific background concentrations. As indicated on Figure 4, alpha-BHC and benzene (at PA-52), 2,4-dichlorophenol (at PA-30, PA-52 and PA-54), and pentachlorophenol (at PA-54) were detected in soil samples at concentrations exceeding their respective area background values. The pentachlorophenol and 2,4-dichlorophenol detected in shallow soil are consistent with surface spills in or near the "Penta Accumulation Storage Area" SWMU. The presence of alpha-BHC and benzene (at PA-52) are consistent with historical operations associated with the outdoor BHC product storage pile which, during the 1950s and early 1960s, occupied the area where the maintenance building is today. These releases likely occurred prior to the paving of this area.

2,4-Dichlorophenol (at PA-53) was detected in shallow soil (3-5 feet bgs) at concentrations exceeding area background in the vicinity of the "Sump 425" SWMU. Due to the shallow depth of the 2,4-dichlorophenol in boring PA-53, a leak from the base of the sump is not indicated. The 2,4-dichlorophenol concentrations may be consistent with a surface spill near the sump, a sump overflow, or leaks in shallow piping entering the sump (e.g., trench drains).

2.1.2. Accumulation Storage Area – Shipping and Sump 434

As indicated on Figure 5, 1,1,1-Trichloroethane (at PA-24) was detected in soil at a concentration of 0.68J mg/kg at a depth of 12-14 feet bgs. This value exceeds the area background value of 0.393; however, this concentration is significantly below the Industrial RSL of 38,000 mg/kg. Although 1,1,1-trichloroethane was not manufactured at the Site, it was handled at the Site and therefore its presence at low concentrations is not unexpected.

Although the Accumulation Storage Area-Shipping and Sump 434 were recommended for retention within the Phase II Report, these SWMUs are recommended for no further action.

2.1.3. Basin No. 2

As shown in Figure 19 of the Phase II Report, boring CM-68 is within the boundary of the estimated DNAPL limits in the vicinity of "Basin No. 2" based on the positive dye test results at 23 ft bgs. Sample results in the vicinity of Basin No. 2 are shown on Figure 6. However, no evidence of DNAPL was observed in the overlying samples associated with CM-68. The positive dye test at 23 ft bgs is consistent with lateral migration of Hex DNAPL from beneath the "Former Hex Pit Area" SWMU. Therefore although the Basin No. 2 SWMU was recommended for retention within the Phase II Report, this SWMU is recommended for no further action. ?

2.1.4. Sump 429

As indicated on Figure 7, carbon tetrachloride, hexachlorobenzene, hexachlorobutadiene, hexachloroethane, and perchloroethylene were detected in soil at concentrations exceeding Csat in the vicinity of the "Sump 429" SWMU.

Due to the shallow depth of the detections in PA-35, PA-35C, and PA-35D, a leak from the base of the sump is not indicated. The detections in PA-35, PA-35C, and PA-35D are consistent with surface releases of solvents and hex waste-related compounds. This may be an indication of historic waste or off-specification product storage or management in this area.

2.1.5. Location AR-07

As indicated on Figure 8, 1,1,1-Trichloroethane (at AR-07) was detected in soil at a concentration of 0.67/0.65 mg/kg at a depth of 10.5 to 13.5 feet bgs. This value exceeds the area background value of 0.393; however, this concentration is significantly below the Industrial RSL of 38,000 mg/kg. Although 1,1,1-trichloroethane was not manufactured at the Site, it was handled at the Site and therefore its presence at low concentrations is not unexpected.

The concentration of 1,1,1,-trichloroethane is consistent with minor surface spills near the railroad tracks. This location is recommended for no further action.

2.1.6. Location CM-25

As indicated on Figure 9, 1,2-dichloroethane was detected in boring CM-25 (5.5-7.5 feet bgs) at a concentration (42.6 mg/kg) exceeding the area background (20.21 mg/kg).
1,2-dichloropropane was detected in boring CM-25 (5.5-7.5 feet bgs) at a concentration (18.6 mg/kg) exceeding the area background (6.678 mg/kg).

The former Vulcan Feedstock (VFS) Plant produced chlorinated propanes. The concentrations of 1,2-dichloropropane and 1,2-dichloroethane are consistent with a surface spill associated with the former VFS Plant operations.

2.1.7. Location CM-43

As indicated on Figure 10, perchloroethylene was detected at a concentration of 545 mg/kg; exceeding Csat from the 5 to 7 feet bgs interval of CM-43. Based on the analytical data and observations obtained from CM-69 (Phase II boring) and CM-43, these data, in conjunction with the data/observations from several nearby RFI soil borings, do not indicate the presence of DNAPL in this portion of the Site. Furthermore, the analytical data resulting from CM-69 and the other nearby RFI soil borings indicate that the area where the perchloroethylene exceeding Csat was detected appears to be limited to the immediate area around CM-43.

Perchloroethylene was packaged at the Drum Filling Warehouse located immediately to the west of boring CM-43. The packaged chemicals were loaded onto trucks in this area as well. The concentration of perchloroethylene at CM-43 is consistent with a surface spill of product during handling or packaging.

2.1.8. Location PA-38

As indicated on Figure 11, 1,1,1-trichloroethane was detected at a low concentration of 0.4 mg/kg, exceeding the area background (0.393 mg/kg), from the 4 to 6 feet bgs interval of soil boring PA-38. The detected concentration is well below the Industrial RSL of 38,000 mg/kg.

Location PA-38 is at the southwest corner of the drum filling warehouse. The 1,1,1-trichloroethane concentration may also be attributed to a minor surface spill in this area. This location is recommended for no further action.

2.1.9. Location SO-5

As indicated on Figure 12, benzene was detected at a low concentration of 0.03 mg/kg, exceeding the area background (0.0252 mg/kg), from the 5 to 9 feet bgs interval of soil boring SO-05. The detected concentration of benzene is well below the Industrial RSL of 5.4 mg/kg.

During the early 1960s (and likely the 1950s) a BHC product stockpile was located in the SO-5 area. The benzene detected in soil boring SO-5 is consistent with the migration of trace amounts of benzene in the stockpile to the underlying soil. This location is recommended for no further action.

2.2. Inorganics Area

The Inorganics Area contains seven SWMUs and other locations specifically identified by the Phase II Report. These locations are described in detail below.

2.2.1. Asbestos Surface Impoundment

Prior to 1977, the Asbestos Surface Impoundment and associated repair bays were used for the maintenance of asbestos diaphragm cells. Any asbestos which was lost during cell cleaning or repair would settle on the bottom of the repair bays or the two cells of the surface impoundment. Asbestos does not migrate appreciably through fine-grained soils and direct contact exposure routes are incomplete due to the impermeable concrete cap that was placed in this area as part of the ICM. The soil sample results in the vicinity of the Asbestos Surface Impoundment are shown on Figure 13.

2.2.2. Cell Repair Sump

The diaphragm cells used in the chlor-alkali process are repaired in the Cell Repair Building. The Cell Repair Sump is located in the Cell Repair Building and receives potentially asbestos-impacted water from a trench drain and cooling tower blowdown water (CRA, 2010).

Although no samples were able to be collected from the immediate area, there is no evidence of a release from the "Cell Repair Sump" SWMU. It is expected that any release from this SWMU would be localized due to the general immobility of asbestos in the subsurface. This SWMU was retained because it was inaccessible during the field activities. The soil sample results in the vicinity of the Cell Repair Sump are shown on Figure 14.

2.2.3. Location IA-03

As indicated on Figure 15, trichloroethene was detected at a low concentration of 0.37 mg/kg, exceeding the area background (0.223 mg/kg), from the 14 to 16 feet bgs interval of soil boring IA-03. This detection is well below the industrial RSL of 6.4 mg/kg. This low level detection is believed to originate from possible surface water runoff from the Old Solar Pond located a short distance to the north (or alternately, Basin No. 3 or Sump 478).

Although Location IA-03 was recommended for retention within the Phase II Report, this area is recommended for no further action.

2.2.4. Location IA-13

As indicated on Figure 16, trichloroethene was detected at a concentration of 0.28 mg/kg, exceeding the area background (0.223 mg/kg), in the 4 to 6 feet bgs interval of soil boring IA-19. The industrial RSL for trichloroethene is 6.4 mg/kg.

Soil boring IA-13 is located within a pervious area and the detection may be related to possible surface water runoff from the Organics Area to the north of the adjacent road. This detection of trichloroethene is consistent with a minor surface spill.

Although Location IA-13 was recommended for retention within the Phase II Report, this area is recommended for no further action.

2.2.5. Location IA-19

As indicated on Figure 17, beta-BHC (at IA-19) was detected in soil at concentrations exceeding the background values at location IA-19 (1.836 mg/kg).

Historic aerial photographs indicate that the IA-19 boring is located in a historically low-lying wet area. The detected concentrations of BHC are consistent with the accumulation of wind-blown Alpha Cake waste originating from the Landfill Area prior to its capping in 1977. Alternate release scenarios include surface water runoff from the former solar pond or railroad.

2.2.6. Location IA-50

As indicated on Figure 18, carbon tetrachloride was detected at a concentration of 1.87 mg/kg, exceeding the area background (1.037 mg/kg), in the 2 to 4 foot bgs interval of soil boring IA-50. This detection is below the Industrial RSL of 3 mg/kg and is located in an area covered by concrete.

This detection may have originated from a minor release from the adjacent roadway. Although Location IA-50 was recommended for retention within the Phase II Report, this area is recommended for no further action.

2.2.7. Location IA-56

As indicated on Figure 19, hexachlorobenzene was detected at a concentration of 0.74 mg/kg, exceeding area background (0.43 mg/kg), in the 8 to 10 foot bgs interval of soil boring IA-56. This detection is below the Industrial RSL of 1.1 mg/kg and is located in an area covered by concrete.

This detection may have originated from possible runoff from the Penta Area to the north. Although Location IA-56 was recommended for retention within the Phase II Report, this area is recommended for no further action.

2.3. Landfill Area

The Landfill Area includes 12 AOCs/SWMUs, of which 3 require additional evaluation. The three AOC/SWMU locations are shown on Figures 20 and 21, along with analytical and geophysical results.

2.3.1. Alpha Cake Landfill

The waste stored in the Alpha Cake Landfill consists primarily of alpha-BHC and other BHC isomers. The Alpha Cake Landfill was capped in 1977. The low permeability soil cap of this ICM prevents the direct contact exposure routes (ingestion and inhalation) and minimizes the infiltration of rainwater through the waste.

2.3.2. Brine Ponds

The waste stored in the Brine Ponds consists primarily of brine sludge (sodium chloride, sodium carbonate, sodium sulfate, sodium hydroxide) and soil originating from the old solar pond. The Brine Ponds were capped in 1977. The low permeability soil cap prevents the direct contact exposure routes (ingestion and inhalation) and minimizes the infiltration of rainwater through the waste.

2.3.3. Hex Waste Pits

Hex Waste was trench disposed in the Hex Waste Pits prior to 1977. The Hex Waste Pits were capped in 1977. The low permeability soil cap prevents the direct contact exposure routes (ingestion and inhalation) and minimizes the infiltration of rainwater through the soil. Hex Waste was not identified directly during the 2009 landfill investigation.

2.4. Non-Process Area

The Non-Process Area includes ten AOCs/SWMUs. No soil samples were identified with concentrations exceeding the background concentration values.

None of the AOCs/SWMUs in the Non-Process Area were associated with a background exceedence.

2.5. Nature and Extent of DNAPL and Potential Source Material

DNAPL can occur as immobile ganglia, fingers, and blebs at residual saturation in coarse-grained porous media or as pools on tops of low-permeability layers. The complex distribution of DNAPL in the subsurface is also referred to as the entrapment architecture. Although pools of DNAPL can contain a significant mass of contaminants, residual DNAPL often has a greater contribution to downgradient groundwater concentrations due to the much larger surface area of groundwater contact (National Research Council, 2013, p. 26). In fact, hydrogeology, biogeochemistry, and DNAPL entrapment architecture, and not total DNAPL mass, control many of the most important parameters involved in mass fate and transport (e.g., source and plume longevity, plume length, etc.).

The mass of DNAPL at the Site cannot be reliably estimated due to the complex contaminant distribution in the subsurface and other complicating factors related to geology, release and transport mechanisms, and differential weathering. DNAPLs preferentially move through zones with the highest permeability, which may only take up a small fraction of the aquifer matrix. DNAPL can also enter low permeability zones (e.g., silt and clay units) through fractures and other secondary porosity features (e.g., roots, worm casts, or animal borings) (ITRC, 2011, p. 11).

The entrapment architecture creates many challenges for site remediation because of the difficulty in locating and treating the DNAPL (Wilking, Rodriguez, & Illangasekare, 2013), which is described in the EPA Groundwater Issue: Assessment and Delineation of DNAPL Source Zones at Hazardous Waste Sites:

> *"Given the selective nature of DNAPL migration, it is not feasible to determine the exact location and extent of individual DNAPL migration pathways within the overall confines of the source zone in either unconsolidated deposits, or fractured bedrock" (Kueper & Davies, 2009, p. 8).*

Several researchers have attempted to quantify the error associated with mass estimation of DNAPL sources. Even under controlled laboratory conditions where a known mass is added, mass estimates can very over several orders of magnitude, depending on the spatial sampling interval on which the estimate is based. While, high-density sampling can be used to gain insight into the mass flux from a system, sampling intervals larger than a fraction of a centimeter vertically and horizontally may result in large variations in mass estimates, potentially orders of magnitude. Such estimates, if they were possible, yield little useful information, such as an indication of the longevity of the mass flux or the steady-state plume length. As mentioned above, much more important is the DNAPL architecture, which is site-specific and which also cannot easily be measured directly. A valuable surrogate to estimate important information for site decision-making is mass flux, which has been the focus of recent research - to the exclusion of DNAPL mass estimates.

The Phase II Report identified four areas where indications of DNAPL were observed extending through the saturated zone. These areas are:

- Eastern Hex Area
- Northwestern Hex Area
- Landfill Hex Area
- CT & Perc Area

The three Hex areas are locations where Hex Waste was stored or disposed. The chemical composition of the samples in this area is shown on Figures 22-24.

Hex DNAPL in the Eastern Hex Area is associated with the temporary storage of Hex Waste in earthen pits prior to disposal in the Landfill Area. Based on the results of the Phase I and Phase II RFIs, the "Former Hex Pit Area" SWMU was expanded to encompass a larger area (shown on Figure 2). The chemical composition of soil samples in this area is shown on Figure 22. Although hexachlorobutadiene is the dominant component of the DNAPL, several vadose zone samples exhibit high proportions of perchloroethylene. Saturated zone samples show considerably less variation in their composition. The areal extent of DNAPL zones are described in Figures 19-23 of the Phase II Report.

Hex DNAPL in the Northwestern Hex Area is associated with the likely temporary storage of Hex Waste in earthen pits prior to disposal in the Landfill Area. Based on the results of the Phase I and Phase II RFIs, the "Former Northwest Hex Quench Pit Area" SWMU was introduced (shown on Figure 3). The chemical composition of soil samples in this area is shown on Figure 23. Hexachlorobutadiene is the dominant component of the DNAPL. The sample from DB-13 (54.7-55.2 feet bgs) is primarily composed of perchloroethylene and carbon tetrachloride and may have traveled laterally from the Carbon Tetrachloride and Perchloroethylene DNAPL Area on top of the C2 clay unit. The areal extent of DNAPL zones are described in Figures 19-23 of the Phase II Report.

Hex DNAPL in the Landfill Area is associated with the trench disposal of Hex Waste prior to the capping of the landfill in 1977. The chemical composition of soil samples in this area is shown on Figure 24. The DNAPL in the Landfill Area is composed of varying proportions of hexachlorobenzene, hexachlorobutadiene, perchloroethylene, with lesser proportions of other analytes. Samples from the Alpha Cake Landfill are composed primarily of alpha-BHC with lesser amounts of other BHC isomers and other analytes.

The Landfill Area RFI Summary Report (and various other reports) document Vulcan's estimate of the total mass of Hex Waste produced prior to the 1977 closure of the landfill (CRA, 2011, pp. 3-4)[1]. A portion of this amount may be present as DNAPL beneath the Northwestern Hex Area, the Eastern Hex Area, and the Landfill Hex Area. The amount of Hex DNAPL identified in these areas is not inconsistent with the mass estimates provided by Vulcan.

The CT & Perc area exhibits indications of DNAPL in the C4 clay unit at PA-35, PA-35C, and PA-35D. The chemical composition of samples from these borings includes carbon tetrachloride dominant (at PA-35), perchloroethylene dominant (at PA-35C, 0.9-1.4 feet bgs), and hexachloroethane dominant (at PA-35D and PA-35C, 8-9 feet bgs)[2] mixtures. The varied nature of these sample results suggests various independent releases in this area. The relative absence of hexachloroethane in deeper samples suggests a release more recent than the others. Deeper samples show less variability and perchloroethylene and carbon tetrachloride tend to dominate. The chemical composition of the samples in this area is shown on Figure 25. The mass of DNAPL in this area cannot be reliably estimated due to the heterogeneous nature of the geology, the DNAPL occurrence in thin bands and fingers, the varying degrees of saturation, and the varying chemical composition. In general, there is expected to be significantly less DNAPL in this area than the Hex areas.

Several areas were also identified where indications of the presence of DNAPL do not extend through the surficial C4 clay unit. These locations (e.g., CM-43 and PA-54) are very limited in areal and vertical extent.

Section 3.0 Exposure Pathway Analysis

3.1. Characterization of Exposure Setting

As part of the Human Health Risk Assessment (HHRA) process, potential exposure pathways are determined through an evaluation of the physical setting of an exposure area and the potentially exposed populations. The consideration of site-specific factors related to land usage is important in the development of realistic current and future exposure scenarios and quantification of risks and hazards. The current and future potential land uses that are reasonably expected for an exposure area determine what populations may potentially be exposed.

[1] Insufficient information is currently available to replicate or validate the estimates calculated by Vulcan.
[2] The high proportion of hexachloroethane in these samples indicates that they may exist as a free-phase solid.

The following five exposure areas: Inorganic Area; Organic Area; Non Process Area; Landfill Area; and Nature Center have been identified for which human risks will be assessed. The location of these five exposure areas is shown on Figure 26. The following discusses the anticipated receptor populations that are expected to be present based on the current and potential future exposure setting of each of these exposure areas.

The current land use of each of the exposure areas except for the Nature Center is industrial/commercial. The Nature Center is considered to be a naturalized area. These land uses are expected to continue in the future. Under the industrial/commercial land use, the potentially exposed populations under a current/future scenario include persons who may infrequently trespass (trespassers), industrial/commercial workers associated with the industrial/commercial land use, and maintenance workers associated with the outdoor maintenance activities. Trespassing within the Inorganic and Organic Exposure Areas is expected to be very limited due to the security fence and 24-hour active guard security. Future redevelopment or maintenance may necessitate some below-grade excavation or construction activity and/or utility installation and servicing. Therefore, construction/utility workers were identified as receptors that may potentially be present in the future. Within the Nature Center, the potentially exposed populations under a current/future scenario include a recreational user/trespasser and maintenance worker. As permission to enter the Nature Center is required, therefore exposure by recreational user is anticipated to be a short-term exposure. Therefore the recreational user and trespasser have grouped together based on the short-term exposure to the media in the Nature Center. There are currently no residences located within any of the exposure areas and there is no plan to develop any portions of these exposure areas for residential purposes; however, under an unrestricted land use scenario, a hypothetical resident occupying these exposure areas would also be considered in the HHRA as a future scenario. However as planned deed restriction in all five areas to either industrial land use or naturalized land use, a future hypothetical resident will not be considered in the HHRA. As the Landfill Exposure Area will remain as a landfill now and in the future through a planned deed restriction, the industrial/commercial worker is not anticipated to be present within this exposure area. There is also the potential for a recreation user/trespasser to be present within and outside of the Nature Center Exposure Area that may be exposed to surface water and sediments that were impacted due to surface water/storm water runoff or discharge of groundwater to surface water. No surface water/storm water and/or sediment exposures are expected for the Inorganics and Organics Exposure Area, Non-Process Exposure Area, and Landfill Exposure Area due to the facility's storm water zero discharge policy which has been in place since 1977.

The land use in the surrounding area is predominantly agricultural interspersed with industrial facilities (generally adjacent to the railroad), undeveloped areas, and some small residential areas. Given that groundwater impacts extend beyond the defined exposure areas, an off-Site resident was identified as a potential receptor. However, the majority of the adjacent properties to the defined exposure areas are currently owned by OCC. As a result OCC plans to deed restrict these OCC-owned properties to prevent residential or recreational use of these adjacent properties.

An exposure pathway consists of four necessary elements:

- A source and mechanism of constituent release to the environment
- An environmental transport medium for the released constituent
- A point of potential human contact with the medium and the receptors located at these points
- A human uptake route (intake of media containing site-related constituents) at the point of exposure

All four elements must be present for an exposure pathway to be complete. If any one of the four elements is absent, the pathway is incomplete and exposure does not occur. In some cases, a complete exposure pathway is considered to be a minor contributor to human health risks. These exposure pathways will only be assessed qualitatively in the HHRA. The four elements of an exposure pathway are summarized in a conceptual site model (CSM). Preliminary CSMs were developed for each exposure area, including the Inorganic/Organic Area (Figure 27), the Non Process Area (Figure 28), the Landfill Area (Figure 29), the Nature Center (Figure 30). The Site as defined on each CSM is considered to be the exposure area. For example on Figure 27, the "Site" is considered to be the Inorganic and Organic Exposure Areas and therefore any off-Site receptors would be the receptors on the adjacent properties to the referenced exposure area on the CSM. Further details of the information presented in these CSMs are provided below.

3.2. Sources of Exposure and Release Mechanisms

Chemical manufacture within the Inorganic and Organic Exposure Areas has occurred since 1952. Subsurface impacts have occurred primarily through historical releases and waste disposal activities. Spills have also occurred however it has been assumed that the majority of the visual impacts due to the spills would have been removed and cleaned up immediately after the spill. However, there is the potential that residual impacts still remain within the soils and a result of leaching activities in the groundwater. Contaminants can be transported from the source areas via several different mechanisms. The most significant contaminant transport mechanisms at the Site are expected to be:

- Potential leaching of contaminants from contaminated soil to groundwater
- Potential release of contaminants from soil to soil gas to ambient air or indoor air by volatilization and/or wind
- Potential release of contaminants from groundwater to soil gas to ambient air or indoor air by volatilization through the unsaturated zone
- Overland transport via surface water/storm water runoff and deposition to sediment

3.3. Exposure Routes

As presented above, the impacted media within each exposure area could include soil, groundwater, air, surface water/storm water, and sediment. Groundwater is present at depths greater than 50 feet below ground surface therefore exposure to groundwater will be limited. Exposure pathways are used to describe how a contaminant could move from the impacted media (soil, groundwater, etc.) to a point where it can come in contact with the body. The following exposure pathways are considered in the human health CSM:

- Direct contact to soil through incidental ingestion and dermal contact
- Indirect contact to soil through inhalation of particulates in ambient air
- Indirect contact to soil through inhalation of vapors in ambient/indoor air
- Direct contact to groundwater through potable use
- Indirect contact to groundwater through inhalation of vapors in ambient/indoor air
- Direct contact to surface water/storm water through incidental ingestion and dermal contact
- Direct contact to sediment through incidental ingestion and dermal contact

3.4. Exposure Points

After contaminated or potentially contaminated media have been identified, the exposure points are determined by identifying whether or not the potentially exposed population can contact these media.

Incidental ingestion and dermal contact of soil is complete only in areas that are not covered. Therefore, soil ingestion and dermal contact could only occur in areas not under a cover.

However, it will be conservatively assumed in the HHRA that all soil data is available for exposure (i.e., not covered).

Trespassers, industrial/commercial workers, and maintenance workers are expected to conduct activities at or near the ground surface. Therefore, it will be assumed that trespassers, industrial/commercial workers, and maintenance workers will be exposed to only surface soils under a current/future exposure scenario.

Trespassers and maintenance workers are expected to spend their entire time outdoors at the Site. Furthermore these receptors are expected to conduct activities at or near the ground surface, and therefore contact with groundwater is not expected to occur. Therefore, ingestion and dermal contact with groundwater for trespassers and maintenance workers are considered to be incomplete exposure pathways that do not require evaluation in the HHRA.

Trespassers, maintenance worker, and construction/utility workers are expected to spend their entire time outdoors at the Site, and therefore will not be exposed to groundwater through potable use. Groundwater is not currently used as a potable water source in any of the exposure areas, and therefore, the potable groundwater exposure for industrial/commercial workers is considered to be an incomplete pathway under a current scenario. However, it will be assumed in the HHRA that groundwater could be used for potable purposes in the future for exposure by industrial/commercial workers and off-Site residents.

Trespassers, maintenance workers, and construction/utility workers are expected to spend their entire time outdoors at the Site, and therefore will not be exposed to soil/groundwater vapours migrating to indoor air.

The inhalation of vapors from groundwater and subsurface soils migrating through the vadose zone to ambient air is considered to be a potentially complete exposure pathway. However, it is expected that negligible exposure levels would result in ambient air as vapors from groundwater and subsurface soils migrate through the vadose zone. As such, inhalation of vapors from groundwater and subsurface soils migrating to ambient air will rapidly disperse and become diluted once volatilized to ambient air which will reduce exposure to negligible exposure levels. Therefore this exposure pathway is considered to be minor and exposure will not be evaluated quantitatively in the HHRA for any receptors.

The construction/utility worker is assumed to conduct ground intrusive activities that intersect the surface and subsurface soils. However as the groundwater is approximately 50 feet below ground surface, any of the ground intrusive activities are not anticipated to contact the groundwater table. Therefore, the HHRA will not evaluate the construction/utility worker exposure to groundwater through direct contact (incidental ingestion and dermal contact) and inhalation of groundwater vapours accumulating within a trench/excavation.

3.5. Exposure Scenarios and Complete Exposure Pathways

Based on the information presented above, the media and potential human exposures (i.e., complete pathways) that will be assessed quantitatively in the HHRA by exposure area are presented below.

3.5.1. Inorganic and Organic Exposure Area

As shown on Figure 27, the following exposure pathways will be quantitatively evaluated in the HHRA:

(1) Surface Soil – Current/Future Condition:
- o Dermal contact with surface soil by trespasser, industrial/commercial worker, maintenance worker, construction/utility worker
- o Incidental ingestion of surface soil by trespasser, industrial/commercial worker, maintenance worker, construction/utility worker
- o Inhalation of airborne particulate from surface soil by trespasser, industrial/commercial worker, maintenance worker, construction/utility worker

(2) Subsurface Soil – Current/Future Condition:
- o Inhalation of vapors in indoor air originating from subsurface soil by industrial/commercial workers
- o Dermal contact with subsurface soil by construction/utility worker
- o Incidental ingestion of subsurface soil by construction/utility worker
- o Inhalation of airborne particulate from subsurface soil by construction/utility worker

(3) Groundwater – Current/Future Condition:
- o Inhalation of vapors in indoor air originating from groundwater by industrial/commercial workers

(4) Groundwater –Future Condition:
- o Direct and indirect contact (e.g., ingestion, dermal contact, and inhalation) through potable use by industrial/commercial workers

3.5.2. Non-Process Exposure Area

As shown on Figure 28, the following exposure pathways will be quantitatively evaluated in the HHRA:

(1) Surface Soil – Current/Future Condition:
- Dermal contact with surface soil by trespasser, industrial/commercial worker, maintenance worker, construction/utility worker
- Incidental ingestion of surface soil by trespasser, industrial/commercial worker, maintenance worker, construction/utility worker
- Inhalation of airborne particulate from surface soil by trespasser, industrial/commercial worker, maintenance worker, construction/utility worker

(2) Subsurface Soil – Current/Future Condition:
- Inhalation of vapors in indoor air originating from subsurface soil by industrial/commercial workers
- Dermal contact with subsurface soil by construction/utility worker
- Incidental ingestion of subsurface soil by construction/utility worker
- Inhalation of airborne particulate from subsurface soil by construction/utility worker

(3) Groundwater – Current/Future Condition:
- Inhalation of vapors in indoor air originating from groundwater by industrial/commercial workers

(4) Groundwater –Future Condition:
- Direct and indirect contact (e.g., ingestion, dermal contact, and inhalation) through potable use by industrial/commercial workers

3.5.3. Landfill Exposure Area

As shown on Figure 29, the following exposure pathways will be quantitatively evaluated in the HHRA:

(1) Surface Soil – Current/Future Condition:
- Dermal contact with surface soil by trespasser, maintenance worker, construction/utility worker
- Incidental ingestion of surface soil by trespasser, maintenance worker, construction/utility worker
- Inhalation of airborne particulate from surface soil by trespasser, maintenance worker, construction/utility worker

(2) Subsurface Soil – Current/Future Condition:
- Dermal contact with subsurface soil by construction/utility worker
- Incidental ingestion of subsurface soil by construction/utility worker
- Inhalation of airborne particulate from subsurface soil by construction/utility worker

3.5.4. Nature Center Exposure Area

As shown on Figure 30, the following exposure pathways will be quantitatively evaluated in the HHRA:

(1) Surface Soil – Current/Future Condition:
- Dermal contact with surface soil by recreational user/trespasser, maintenance worker
- Incidental ingestion of surface soil by recreational user/trespasser, maintenance worker
- Inhalation of airborne particulate from surface soil by recreational user/trespasser, maintenance worker

(2) Subsurface Soil – Current/Future Condition:
- Dermal contact with subsurface soil by maintenance worker
- Incidental ingestion of subsurface soil by maintenance worker
- Inhalation of airborne particulate from subsurface soil by maintenance worker

(3) Surface Water/Storm Water – Current/Future Condition:
- Dermal contact with surface water/storm water by recreational user/trespasser, maintenance worker
- Incidental ingestion of surface water/storm water by recreational user/trespasser, maintenance worker

(4) Sediment Water – Current/Future Condition:
- Dermal contact with sediment by recreational user/trespasser, maintenance worker
- Incidental ingestion of sediment by recreational user/trespasser, maintenance worker

Section 4.0 References

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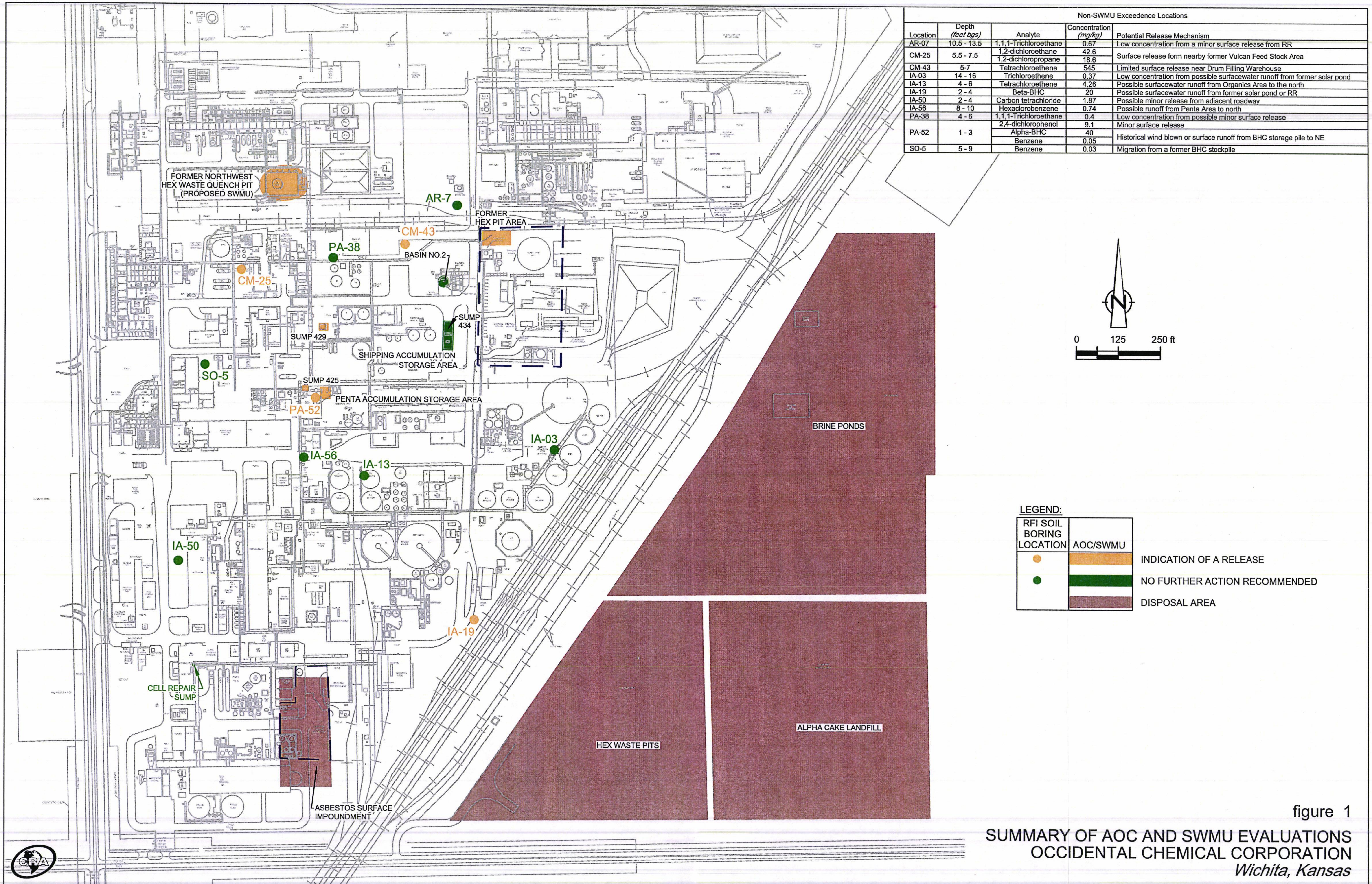


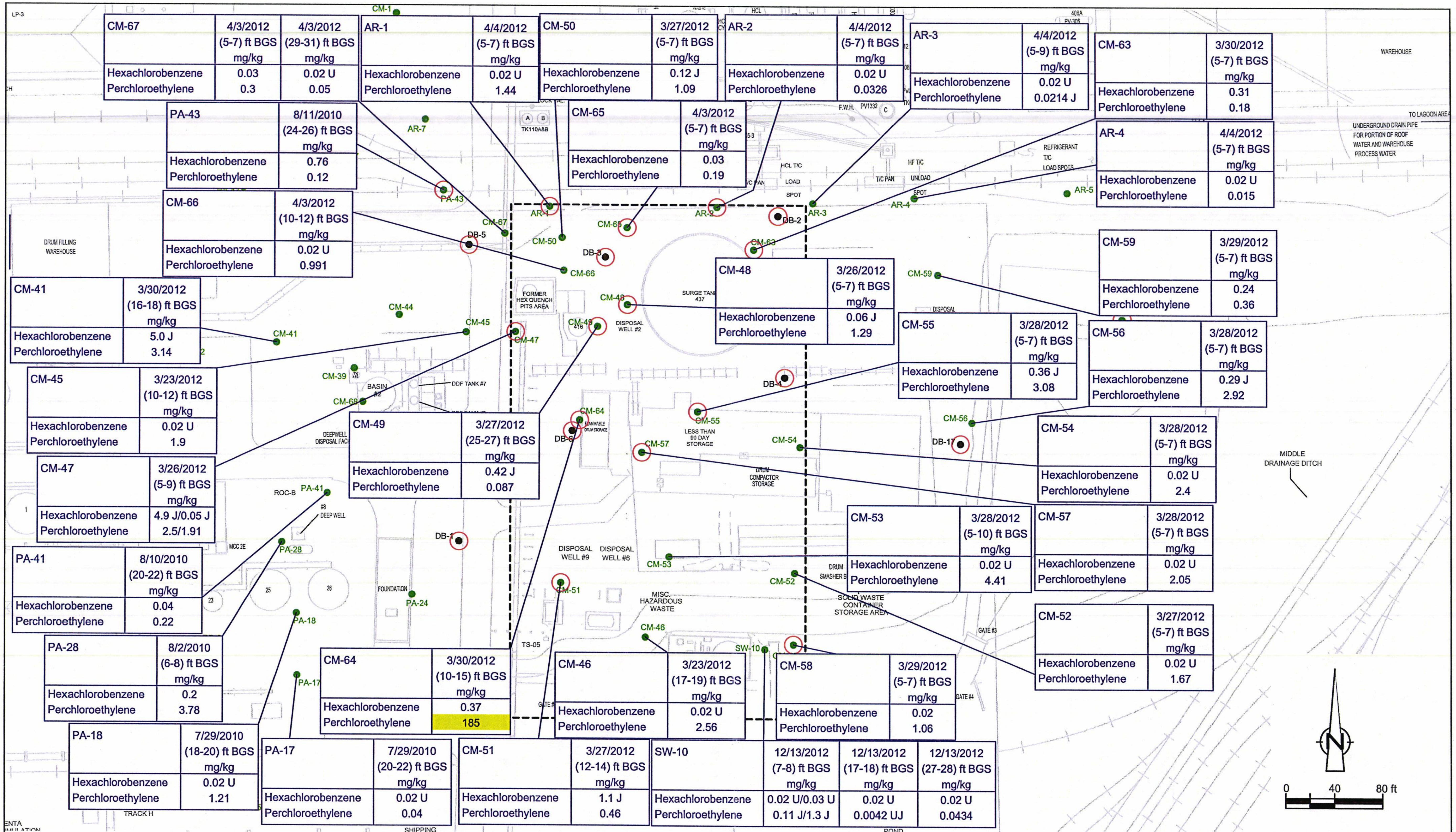
Non-SWMU Exceedence Locations

Location	Depth *(feet bgs)*	Analyte	Concentration *(mg/kg)*	Potential Release Mechanism
AR-07	10.5 - 13.5	1,1,1-Trichloroethane	0.67	Low concentration from a minor surface release from RR
CM-25	5.5 - 7.5	1,2-dichloroethane	42.6	Surface release form nearby former Vulcan Feed Stock Area
		1,2-dichloropropane	18.6	
CM-43	5-7	Tetrachloroethene	545	Limited surface release near Drum Filling Warehouse
IA-03	14 - 16	Trichloroethene	0.37	Low concentration from possible surfacewater runoff from former solar pond
IA-13	4 - 6	Tetrachloroethene	4.26	Possible surfacewater runoff from Organics Area to the north
IA-19	2 - 4	Beta-BHC	20	Possible surfacewater runoff from former solar pond or RR
IA-50	2 - 4	Carbon tetrachloride	1.87	Possible minor release from adjacent roadway
IA-56	8 - 10	Hexaclorobenzene	0.74	Possible runoff from Penta Area to north
PA-38	4 - 6	1,1,1-Trichloroethane	0.4	Low concentration from possible minor surface release
PA-52	1 - 3	2,4-dichlorophenol	9.1	Minor surface release
		Alpha-BHC	40	Historical wind blown or surface runoff from BHC storage pile to NE
		Benzene	0.05	
SO-5	5 - 9	Benzene	0.03	Migration from a former BHC stockpile

figure 1

SUMMARY OF AOC AND SWMU EVALUATIONS
OCCIDENTAL CHEMICAL CORPORATION
Wichita, Kansas

54046-D22105(047)GN-CO001 JUN 19/2014



Sample	Date	Depth	Units	Hexachlorobenzene	Perchloroethylene
CM-67	4/3/2012	(5-7) ft BGS	mg/kg	0.03	0.3
CM-67	4/3/2012	(29-31) ft BGS	mg/kg	0.02 U	0.05
AR-1	4/4/2012	(5-7) ft BGS	mg/kg	0.02 U	1.44
CM-50	3/27/2012	(5-7) ft BGS	mg/kg	0.12 J	1.09
AR-2	4/3/2012	(5-7) ft BGS	mg/kg	0.02 U	0.0326
AR-3	4/4/2012	(5-9) ft BGS	mg/kg	0.02 U	0.0214 J
CM-63	3/30/2012	(5-7) ft BGS	mg/kg	0.31	0.18
PA-43	8/11/2010	(24-26) ft BGS	mg/kg	0.76	0.12
CM-65	4/3/2012	(5-7) ft BGS	mg/kg	0.03	0.19
AR-4	4/4/2012	(5-7) ft BGS	mg/kg	0.02 U	0.015
CM-66	4/3/2012	(10-12) ft BGS	mg/kg	0.02 U	0.991
CM-41	3/30/2012	(16-18) ft BGS	mg/kg	5.0 J	3.14
CM-48	3/26/2012	(5-7) ft BGS	mg/kg	0.06 J	1.29
CM-59	3/29/2012	(5-7) ft BGS	mg/kg	0.24	0.36
CM-55	3/28/2012	(5-7) ft BGS	mg/kg	0.36 J	3.08
CM-56	3/28/2012	(5-7) ft BGS	mg/kg	0.29 J	2.92
CM-45	3/23/2012	(10-12) ft BGS	mg/kg	0.02 U	1.9
CM-49	3/27/2012	(25-27) ft BGS	mg/kg	0.42 J	0.087
CM-54	3/28/2012	(5-7) ft BGS	mg/kg	0.02 U	2.4
CM-47	3/26/2012	(5-9) ft BGS	mg/kg	4.9 J/0.05 J	2.5/1.91
CM-53	3/28/2012	(5-10) ft BGS	mg/kg	0.02 U	4.41
CM-57	3/28/2012	(5-7) ft BGS	mg/kg	0.02 U	2.05
PA-41	8/10/2010	(20-22) ft BGS	mg/kg	0.04	0.22
CM-52	3/27/2012	(5-7) ft BGS	mg/kg	0.02 U	1.67
PA-28	8/2/2010	(6-8) ft BGS	mg/kg	0.2	3.78
CM-64	3/30/2012	(10-15) ft BGS	mg/kg	0.37	185
CM-46	3/23/2012	(17-19) ft BGS	mg/kg	0.02 U	2.56
CM-58	3/29/2012	(5-7) ft BGS	mg/kg	0.02	1.06
PA-18	7/29/2010	(18-20) ft BGS	mg/kg	0.02 U	1.21
PA-17	7/29/2010	(20-22) ft BGS	mg/kg	0.02 U	0.04
CM-51	3/27/2012	(12-14) ft BGS	mg/kg	1.1 J	0.46
SW-10	12/13/2012	(7-8) ft BGS	mg/kg	0.02 U/0.03 U	0.11 J/1.3 J
SW-10	12/13/2012	(17-18) ft BGS	mg/kg	0.02 U	0.0042 UJ
SW-10	12/13/2012	(27-28) ft BGS	mg/kg	0.02 U	0.0434

LEGEND:

- SWMU, RE: FIGURE 24, PHASE II ON-SITE GROUNDWATER INVESTIGATION RFI SUMMARY REPORT
- RFI SOIL BORING LOCATION
- PHASE II ON-SITE GROUNDWATER INVESTIGATION DEEP DELINEATION BORING
- INDICATIONS OF THE PRESENCE OF DNAPL (CSAT EXCEEDENCE OR POSITIVE DYE TEST)

CM-57	3/28/2012 (5-7) ft BGS mg/kg
Perchloroethylene	2.05

SAMPLE IDENTIFIER
SAMPLE DATE
SAMPLE DEPTH
SAMPLE UNITS
SAMPLE RESULT
DETECTED ANAYLTE
EXCEEDS CSAT AND /OR BACKGROUND CRITERIA

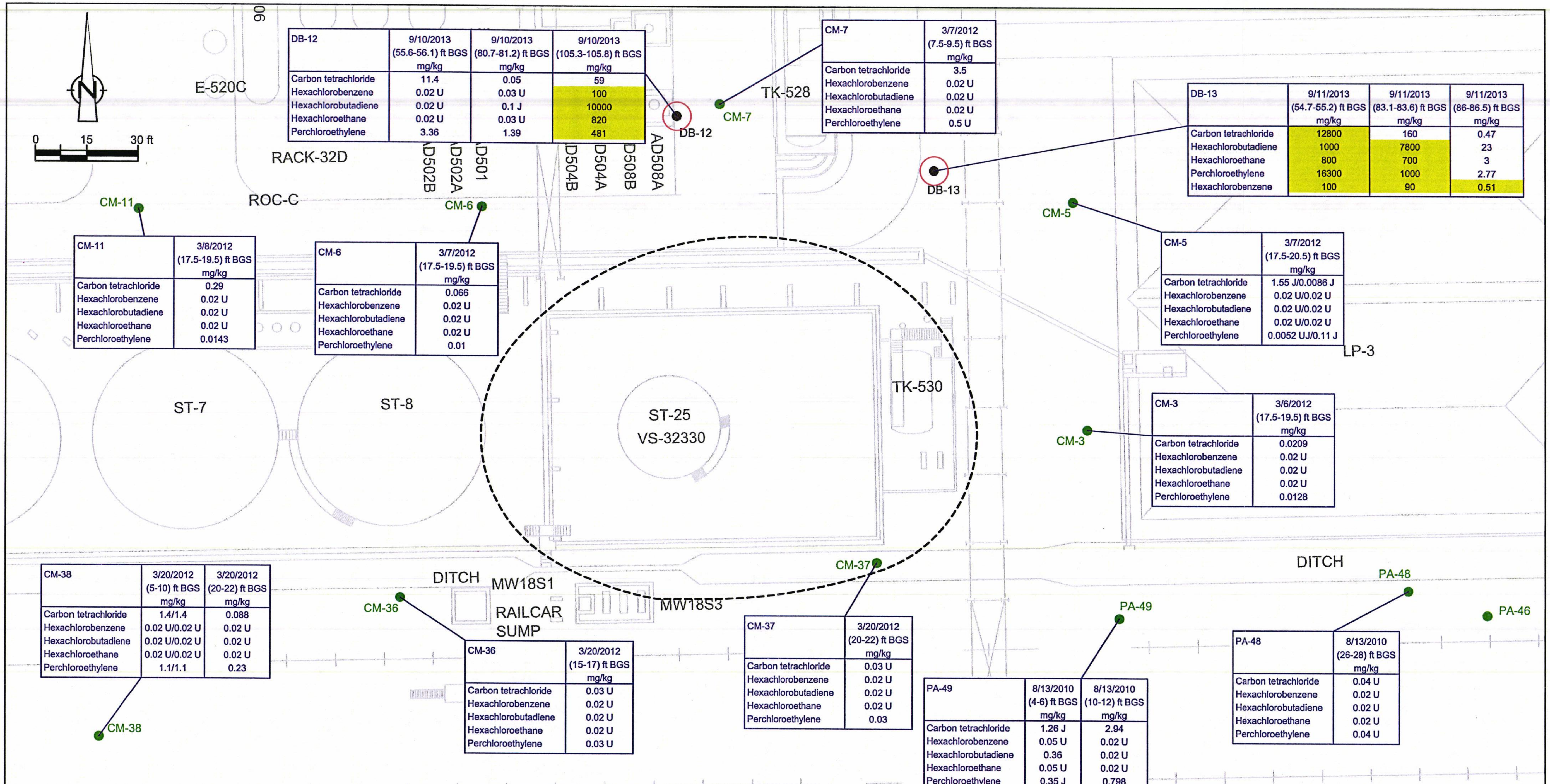
NOTE:

SOIL SAMPLES RANGE FROM GROUND SURFACE TO 30 FEET BELOW GROUND SURFACE
POSITIVE DNAPL INDICATORS IN SOIL BORINGS DB-1, DB-2, DB-3, DB-4, DB-5, AND DB-17

figure 2

FORMER HEX PIT AREA
OCCIDENTIAL CHEMICAL CORPORATION
Wichita, Kansas

54046-D22105(047)GN-CO002 JUN 19/2014



DB-12	9/10/2013 (55.6-56.1) ft BGS mg/kg	9/10/2013 (80.7-81.2) ft BGS mg/kg	9/10/2013 (105.3-105.8) ft BGS mg/kg
Carbon tetrachloride	11.4	0.05	59
Hexachlorobenzene	0.02 U	0.03 U	100
Hexachlorobutadiene	0.02 U	0.1 J	10000
Hexachloroethane	0.02 U	0.03 U	820
Perchloroethylene	3.36	1.39	481

CM-7	3/7/2012 (7.5-9.5) ft BGS mg/kg
Carbon tetrachloride	3.5
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Perchloroethylene	0.5 U

DB-13	9/11/2013 (54.7-55.2) ft BGS mg/kg	9/11/2013 (83.1-83.6) ft BGS mg/kg	9/11/2013 (86-86.5) ft BGS mg/kg
Carbon tetrachloride	12800	160	0.47
Hexachlorobutadiene	1000	7800	23
Hexachloroethane	800	700	3
Perchloroethylene	16300	1000	2.77
Hexachlorobenzene	100	90	0.51

CM-11	3/8/2012 (17.5-19.5) ft BGS mg/kg
Carbon tetrachloride	0.29
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Perchloroethylene	0.0143

CM-6	3/7/2012 (17.5-19.5) ft BGS mg/kg
Carbon tetrachloride	0.066
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Perchloroethylene	0.01

CM-5	3/7/2012 (17.5-20.5) ft BGS mg/kg
Carbon tetrachloride	1.55 J/0.0086 J
Hexachlorobenzene	0.02 U/0.02 U
Hexachlorobutadiene	0.02 U/0.02 U
Hexachloroethane	0.02 U/0.02 U
Perchloroethylene	0.0052 UJ/0.11 J

CM-3	3/6/2012 (17.5-19.5) ft BGS mg/kg
Carbon tetrachloride	0.0209
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Perchloroethylene	0.0128

CM-38	3/20/2012 (5-10) ft BGS mg/kg	3/20/2012 (20-22) ft BGS mg/kg
Carbon tetrachloride	1.4/1.4	0.088
Hexachlorobenzene	0.02 U/0.02 U	0.02 U
Hexachlorobutadiene	0.02 U/0.02 U	0.02 U
Hexachloroethane	0.02 U/0.02 U	0.02 U
Perchloroethylene	1.1/1.1	0.23

CM-36	3/20/2012 (15-17) ft BGS mg/kg
Carbon tetrachloride	0.03 U
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Perchloroethylene	0.03 U

CM-37	3/20/2012 (20-22) ft BGS mg/kg
Carbon tetrachloride	0.03 U
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Perchloroethylene	0.03

PA-49	8/13/2010 (4-6) ft BGS mg/kg	8/13/2010 (10-12) ft BGS mg/kg
Carbon tetrachloride	1.26 J	2.94
Hexachlorobenzene	0.05 U	0.02 U
Hexachlorobutadiene	0.36	0.02 U
Hexachloroethane	0.05 U	0.02 U
Perchloroethylene	0.35 J	0.798

PA-48	8/13/2010 (26-28) ft BGS mg/kg
Carbon tetrachloride	0.04 U
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Perchloroethylene	0.04 U

LEGEND:

SWMU, RE: FIGURE 24, PHASE II ON-SITE GROUNDWATER INVESTIGATION RFI SUMMARY REPORT

RFI SOIL BORING LOCATION

PHASE II ON-SITE GROUNDWATER INVESTIGATION DEEP DELINEATION BORING

INDICATIONS OF THE PRESENCE OF DNAPL (CSAT EXCEEDENCE OR POSITIVE DYE TEST)

DB-12	9/10/2013 (55.6-56.1) ft BGS mg/kg
Carbon tetrachloride	11.4

SAMPLE IDENTIFIER
SAMPLE DATE
SAMPLE DEPTH
SAMPLE UNITS
SAMPLE RESULT
DETECTED ANAYLTE

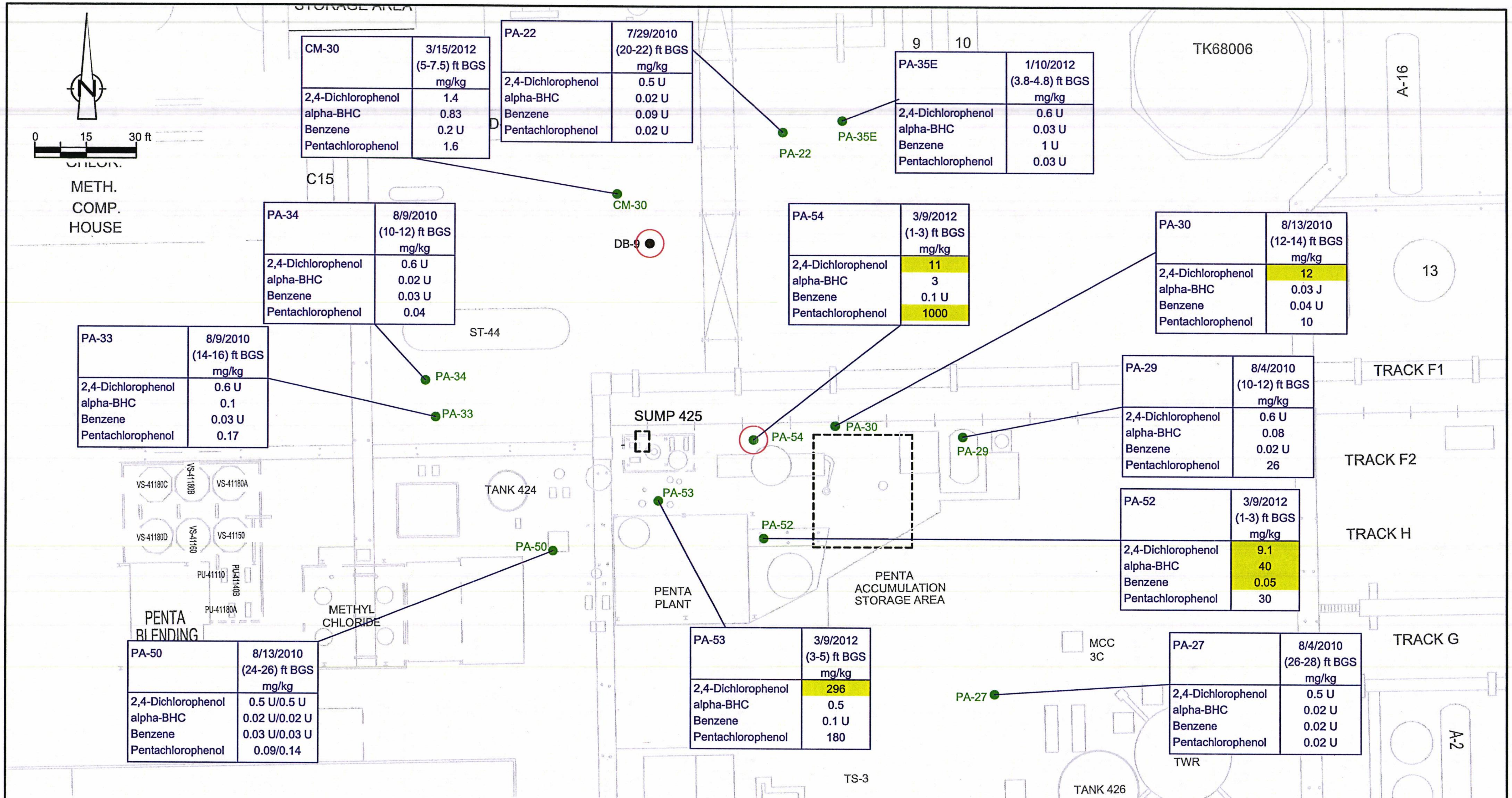
EXCEEDS CSAT AND /OR BACKGROUND CRITERIA

CRA

figure 3

FORMER NORTHWEST HEX WASTE QUENCH PIT
OCCIDENTIAL CHEMICAL CORPORATION
Wichita, Kansas

54046-D22105(047)GN-CO003 JUN 19/2014



CM-30	3/15/2012 (5-7.5) ft BGS mg/kg
2,4-Dichlorophenol	1.4
alpha-BHC	0.83
Benzene	0.2 U
Pentachlorophenol	1.6

PA-22	7/29/2010 (20-22) ft BGS mg/kg
2,4-Dichlorophenol	0.5 U
alpha-BHC	0.02 U
Benzene	0.09 U
Pentachlorophenol	0.02 U

PA-35E	1/10/2012 (3.8-4.8) ft BGS mg/kg
2,4-Dichlorophenol	0.6 U
alpha-BHC	0.03 U
Benzene	1 U
Pentachlorophenol	0.03 U

PA-34	8/9/2010 (10-12) ft BGS mg/kg
2,4-Dichlorophenol	0.6 U
alpha-BHC	0.02 U
Benzene	0.03 U
Pentachlorophenol	0.04

PA-54	3/9/2012 (1-3) ft BGS mg/kg
2,4-Dichlorophenol	11
alpha-BHC	3
Benzene	0.1 U
Pentachlorophenol	1000

PA-30	8/13/2010 (12-14) ft BGS mg/kg
2,4-Dichlorophenol	12
alpha-BHC	0.03 J
Benzene	0.04 U
Pentachlorophenol	10

PA-33	8/9/2010 (14-16) ft BGS mg/kg
2,4-Dichlorophenol	0.6 U
alpha-BHC	0.1
Benzene	0.03 U
Pentachlorophenol	0.17

PA-29	8/4/2010 (10-12) ft BGS mg/kg
2,4-Dichlorophenol	0.6 U
alpha-BHC	0.08
Benzene	0.02 U
Pentachlorophenol	26

PA-52	3/9/2012 (1-3) ft BGS mg/kg
2,4-Dichlorophenol	9.1
alpha-BHC	40
Benzene	0.05
Pentachlorophenol	30

PA-50	8/13/2010 (24-26) ft BGS mg/kg
2,4-Dichlorophenol	0.5 U/0.5 U
alpha-BHC	0.02 U/0.02 U
Benzene	0.03 U/0.03 U
Pentachlorophenol	0.09/0.14

PA-53	3/9/2012 (3-5) ft BGS mg/kg
2,4-Dichlorophenol	296
alpha-BHC	0.5
Benzene	0.1 U
Pentachlorophenol	180

PA-27	8/4/2010 (26-28) ft BGS mg/kg
2,4-Dichlorophenol	0.5 U
alpha-BHC	0.02 U
Benzene	0.02 U
Pentachlorophenol	0.02 U

LEGEND:

- SWMU
- RFI SOIL BORING LOCATION
- PHASE II ON-SITE GROUNDWATER INVESTIGATION DEEP DELINEATION BORING

PA-52	3/9/2012 (1-3) ft BGS mg/kg
Benzene	0.05

- SAMPLE IDENTIFIER
- SAMPLE DATE
- SAMPLE DEPTH
- SAMPLE UNITS
- SAMPLE RESULT
- DETECTED ANAYLTE
- EXCEEDS CSAT AND /OR BACKGROUND CRITERIA
- INDICATIONS OF THE PRESENCE OF DNAPL (CSAT EXCEEDENCE OR POSITIVE DYE TEST)

NOTE:

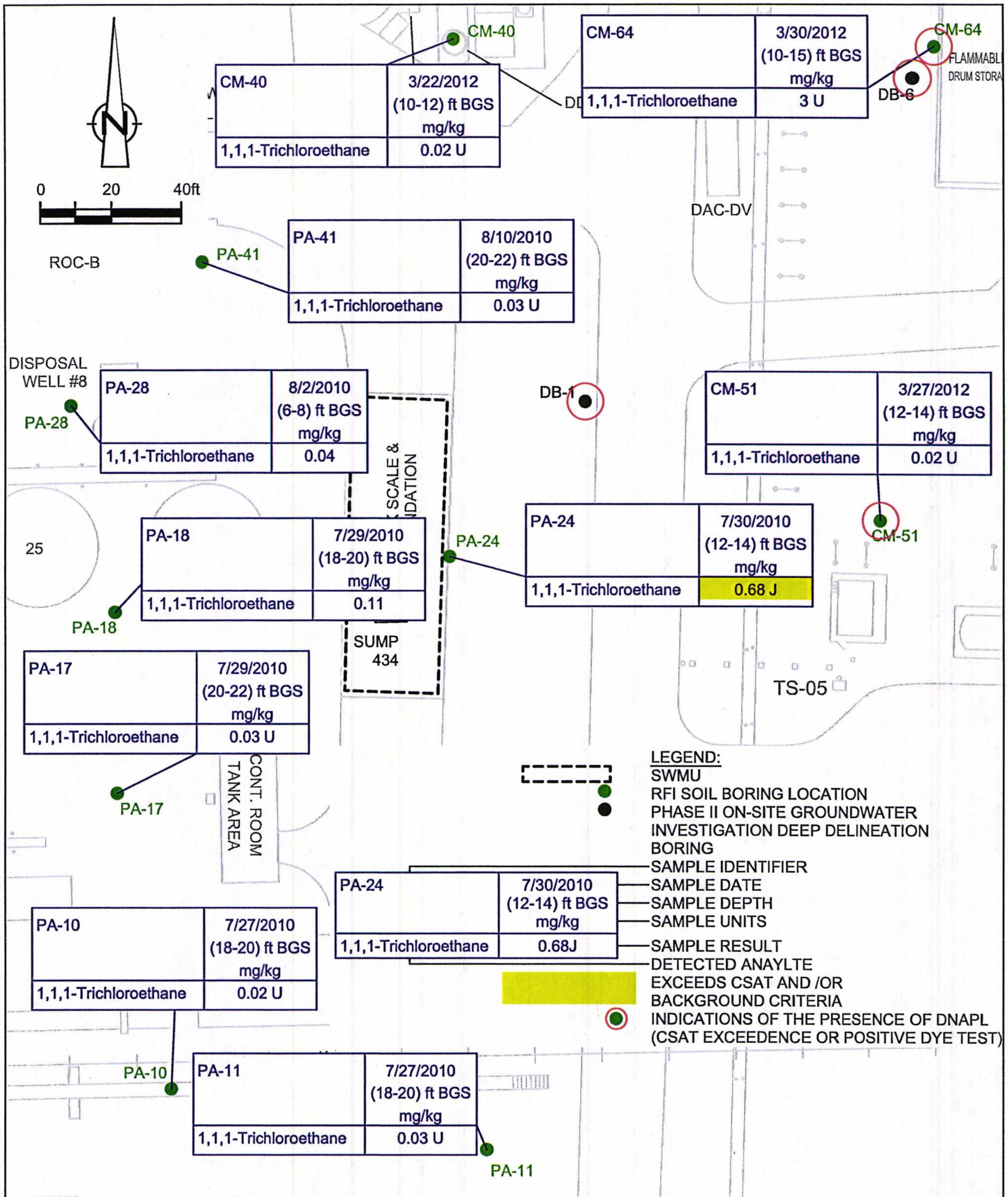
SOIL SAMPLES RANGE FROM GROUND SURFACE TO 30 FEET BELOW GROUND SURFACE

figure 4

PENTA ACCUMULATION STORAGE AREA, SUMP 425, AND LOCATION PA-52
OCCIDENTIAL CHEMICAL CORPORATION
Wichita, Kansas

CRA

54046-D22105(047)GN-CO004 JUN 19/2014



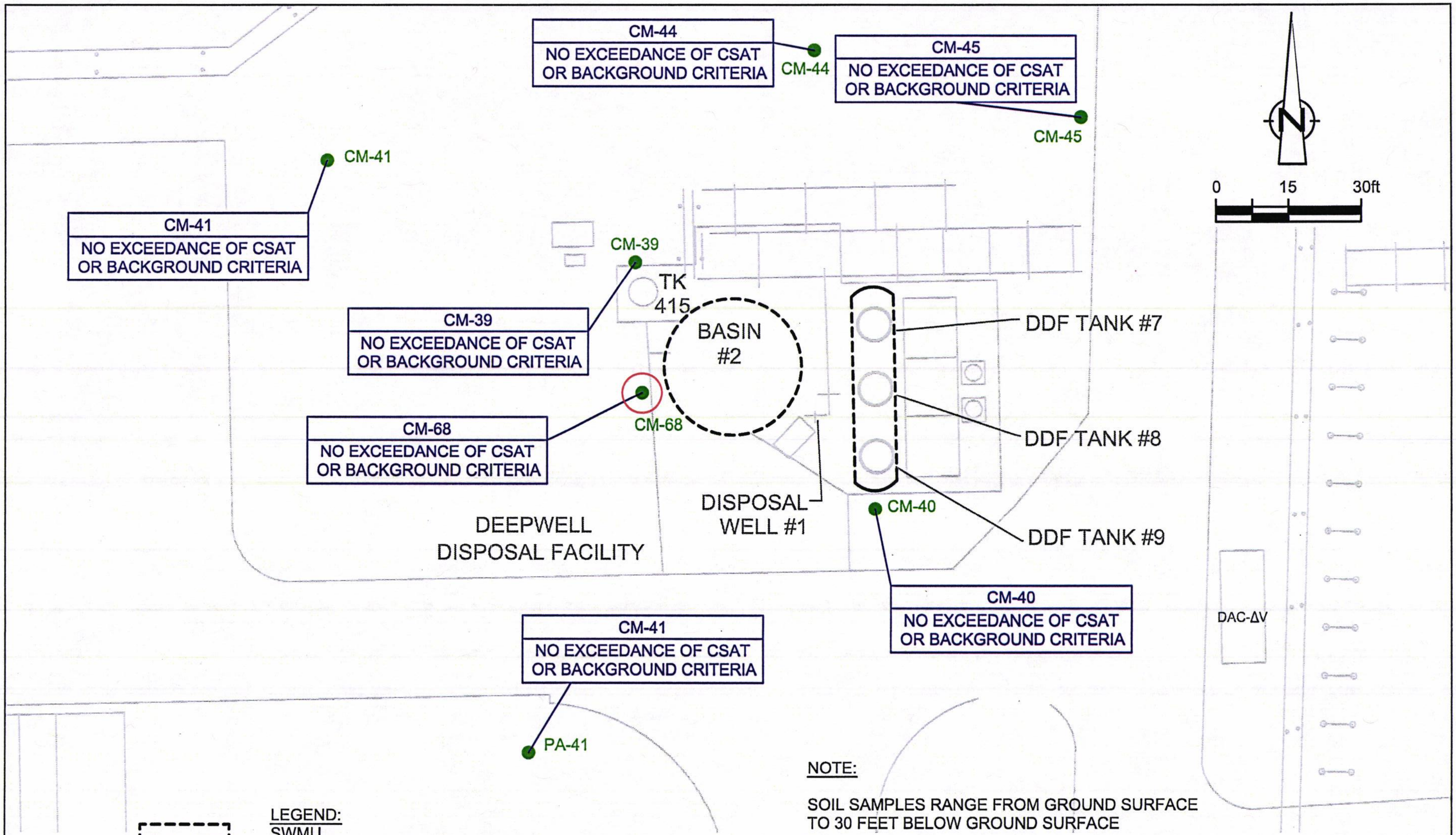
NOTE:

SOIL SAMPLES RANGE FROM GROUND SURFACE TO 30 FEET BELOW GROUND SURFACE

figure 5

ACCUMULATION STORAGE AREA - SHIPPING AND SUMP 434
OCCIDENTIAL CHEMICAL CORPORATION
Wichita, Kansas

54046-D22105(047)GN-CO005 JUN 19/2014



NOTE:

SOIL SAMPLES RANGE FROM GROUND SURFACE TO 30 FEET BELOW GROUND SURFACE

LEGEND:

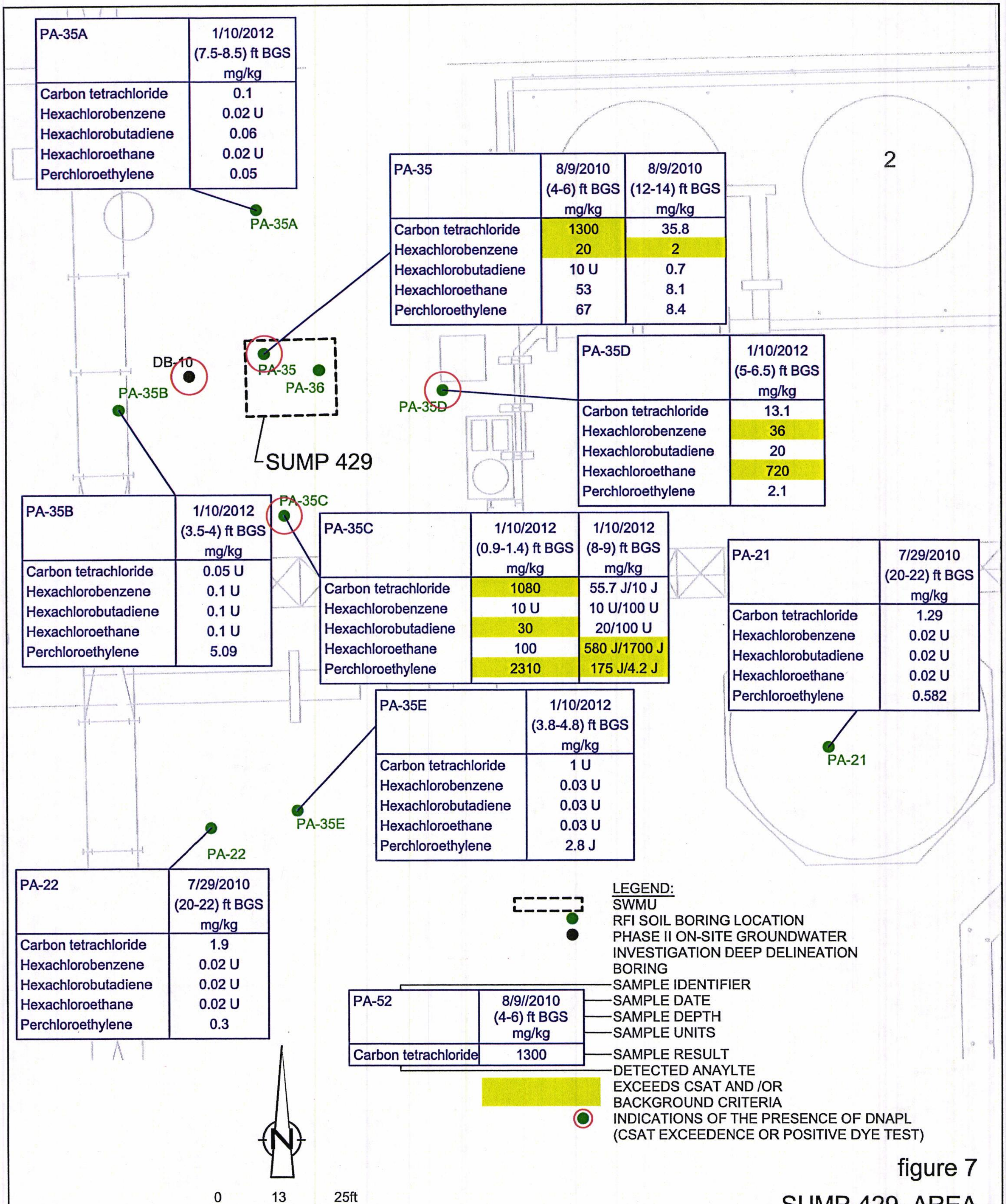
- SWMU
- RFI SOIL BORING LOCATION
- PHASE II ON-SITE GROUNDWATER INVESTIGATION DEEP DELINEATION BORING
- SAMPLE IDENTIFIER
- INDICATIONS OF THE PRESENCE OF DNAPL (CSAT EXCEEDENCE OR POSITIVE DYE TEST)

SOURCE: PHASE II ON-SITE GROUNDWATER INVESTIGATION
RFI SUMMARY REPORT SECTION 4.3 PAGE 28

figure 6

BASIN NO. 2 AREA
OCCIDENTIAL CHEMICAL CORPORATION
Wichita, Kansas

54046-D22105(047)GN-CO006 JUN 19/2014



PA-35A	1/10/2012 (7.5-8.5) ft BGS mg/kg
Carbon tetrachloride	0.1
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.06
Hexachloroethane	0.02 U
Perchloroethylene	0.05

PA-35	8/9/2010 (4-6) ft BGS mg/kg	8/9/2010 (12-14) ft BGS mg/kg
Carbon tetrachloride	1300	35.8
Hexachlorobenzene	20	2
Hexachlorobutadiene	10 U	0.7
Hexachloroethane	53	8.1
Perchloroethylene	67	8.4

PA-35D	1/10/2012 (5-6.5) ft BGS mg/kg
Carbon tetrachloride	13.1
Hexachlorobenzene	36
Hexachlorobutadiene	20
Hexachloroethane	720
Perchloroethylene	2.1

PA-35B	1/10/2012 (3.5-4) ft BGS mg/kg
Carbon tetrachloride	0.05 U
Hexachlorobenzene	0.1 U
Hexachlorobutadiene	0.1 U
Hexachloroethane	0.1 U
Perchloroethylene	5.09

PA-35C	1/10/2012 (0.9-1.4) ft BGS mg/kg	1/10/2012 (8-9) ft BGS mg/kg
Carbon tetrachloride	1080	55.7 J/10 J
Hexachlorobenzene	10 U	10 U/100 U
Hexachlorobutadiene	30	20/100 U
Hexachloroethane	100	580 J/1700 J
Perchloroethylene	2310	175 J/4.2 J

PA-21	7/29/2010 (20-22) ft BGS mg/kg
Carbon tetrachloride	1.29
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Perchloroethylene	0.582

PA-35E	1/10/2012 (3.8-4.8) ft BGS mg/kg
Carbon tetrachloride	1 U
Hexachlorobenzene	0.03 U
Hexachlorobutadiene	0.03 U
Hexachloroethane	0.03 U
Perchloroethylene	2.8 J

PA-22	7/29/2010 (20-22) ft BGS mg/kg
Carbon tetrachloride	1.9
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Perchloroethylene	0.3

LEGEND:

SWMU

RFI SOIL BORING LOCATION

PHASE II ON-SITE GROUNDWATER INVESTIGATION DEEP DELINEATION BORING

PA-52	8/9//2010 (4-6) ft BGS mg/kg
Carbon tetrachloride	1300

SAMPLE IDENTIFIER
SAMPLE DATE
SAMPLE DEPTH
SAMPLE UNITS
SAMPLE RESULT
DETECTED ANAYLTE

EXCEEDS CSAT AND /OR BACKGROUND CRITERIA

INDICATIONS OF THE PRESENCE OF DNAPL (CSAT EXCEEDENCE OR POSITIVE DYE TEST)

NOTE:

SOIL SAMPLES RANGE FROM GROUND SURFACE TO 30 FEET BELOW GROUND SURFACE

figure 7

SUMP 429 AREA
OCCIDENTIAL CHEMICAL CORPORATION
Wichita, Kansas

54046-D22105(047)GN-CO007 JUN 19/2014

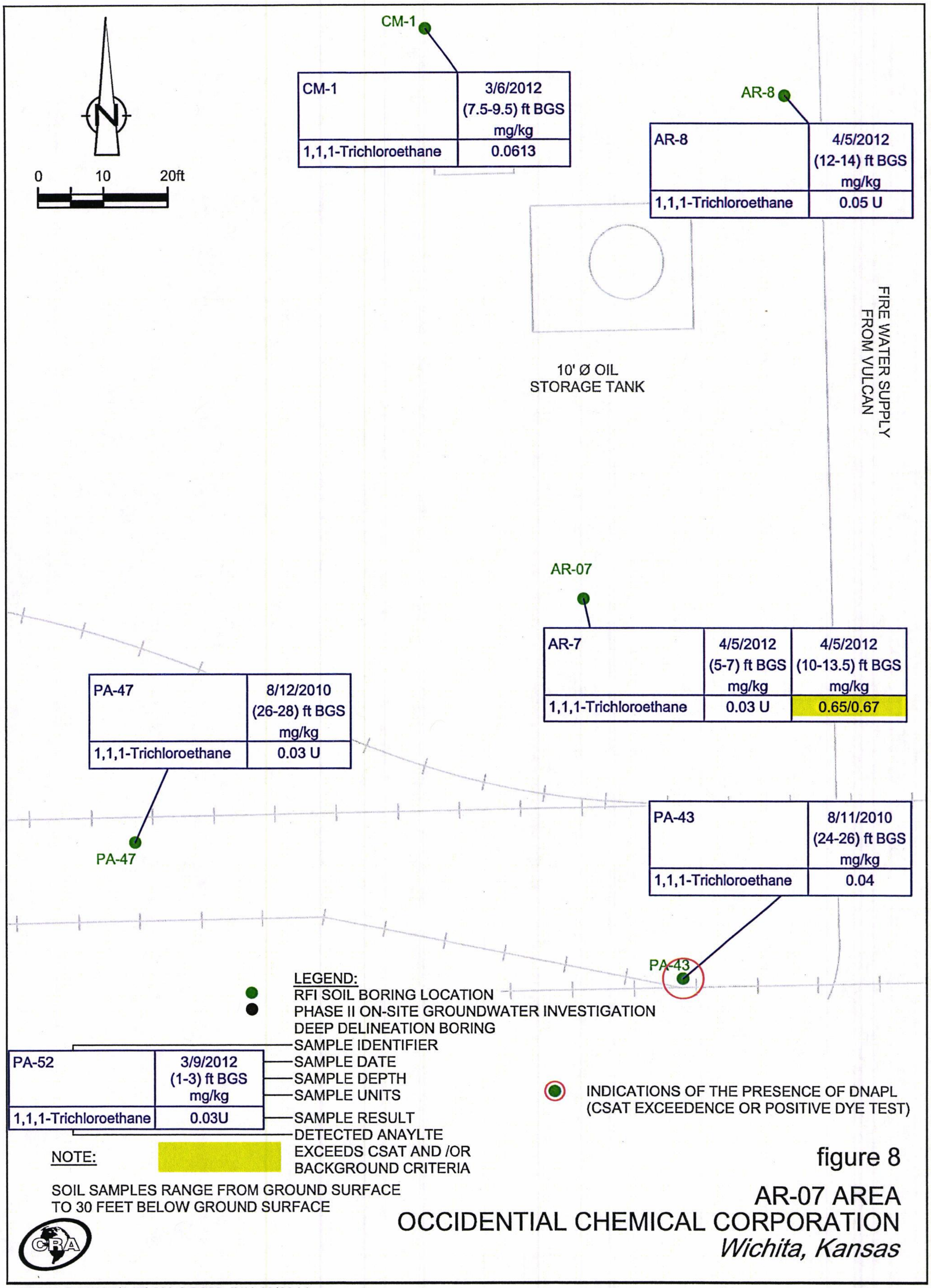
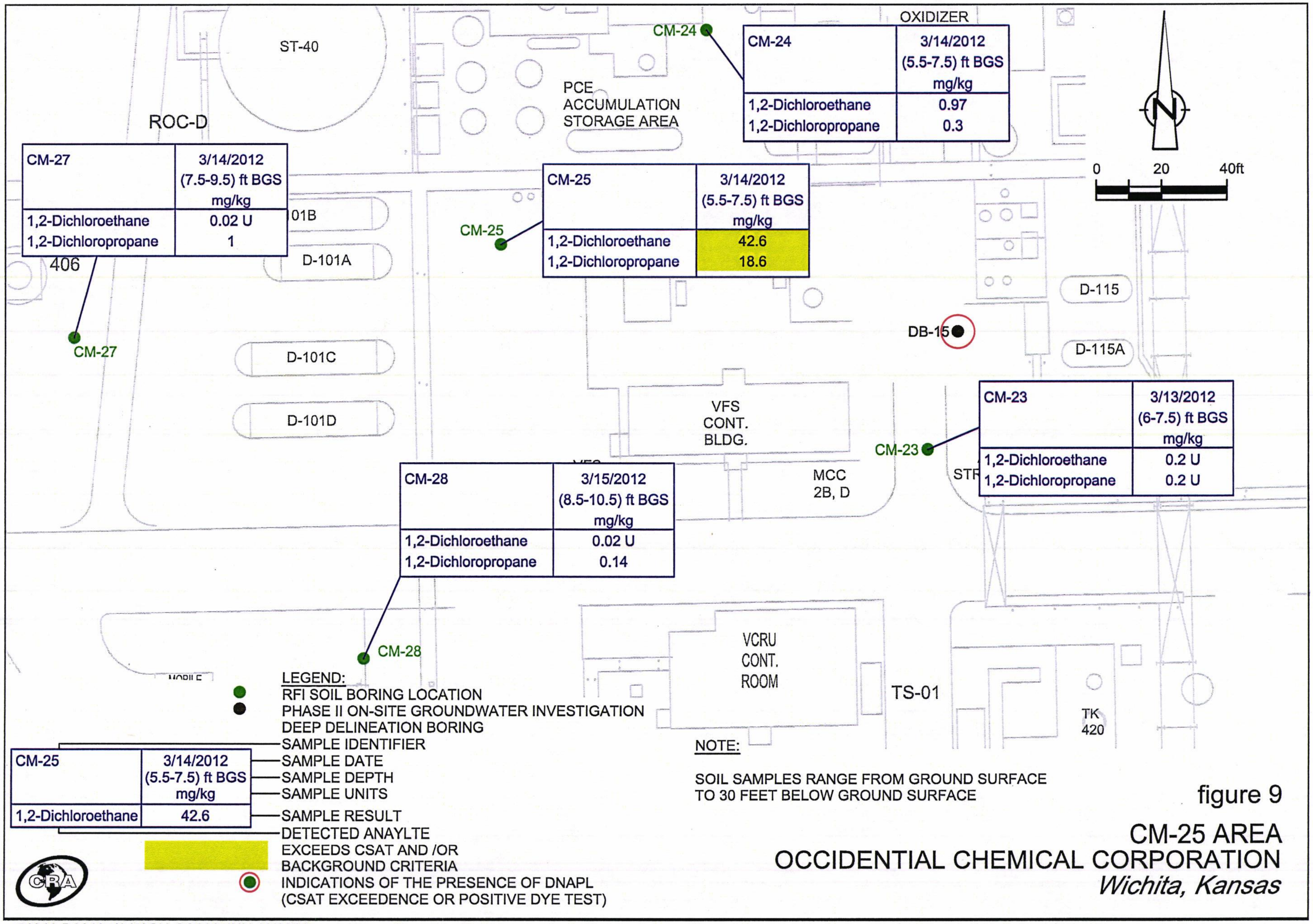


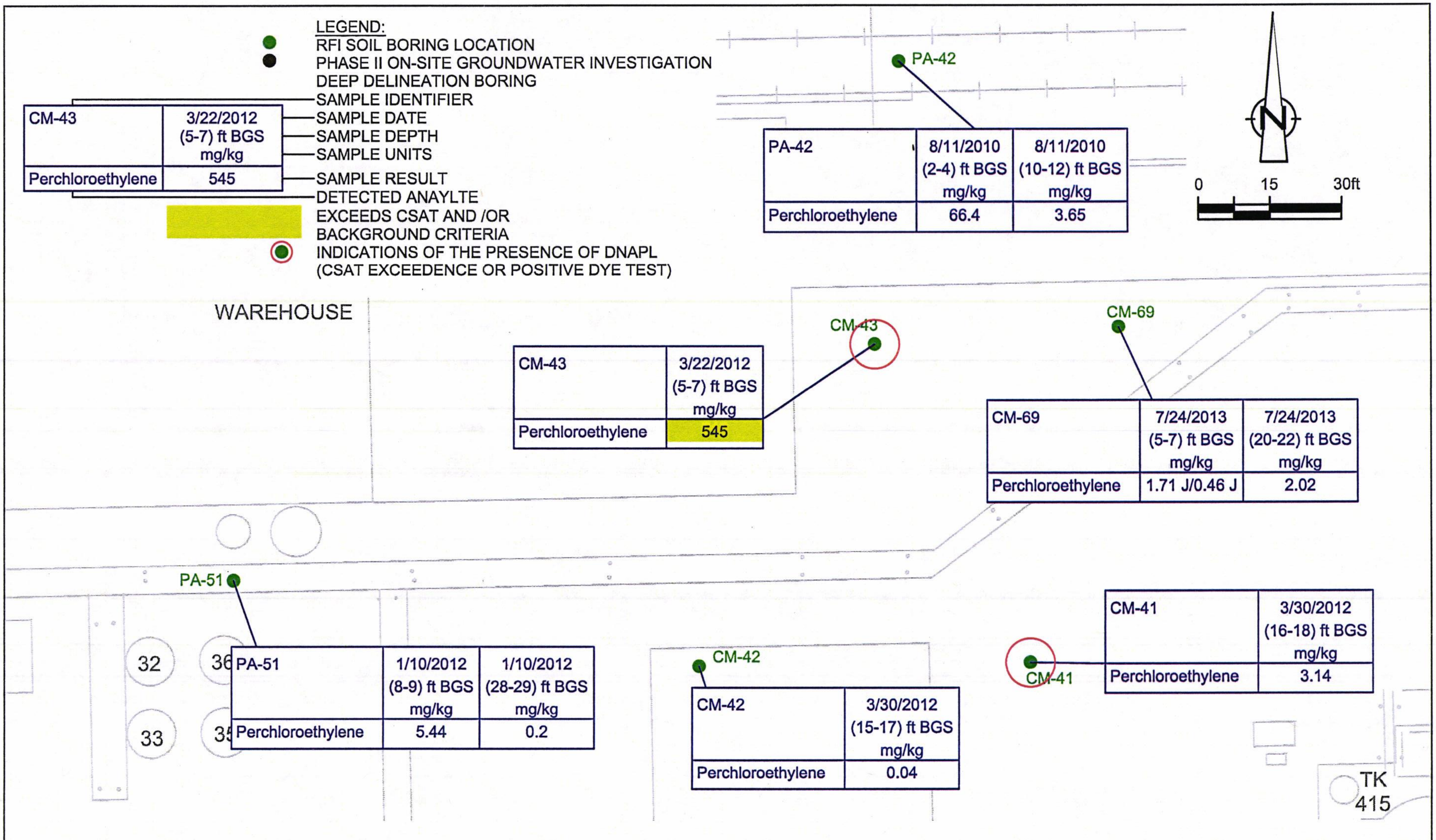
figure 8

AR-07 AREA
OCCIDENTIAL CHEMICAL CORPORATION
Wichita, Kansas

54046-D22105(047)GN-CO008 JUN 19/2014



54046-D22105(047)GN-CO009 JUN 19/2014



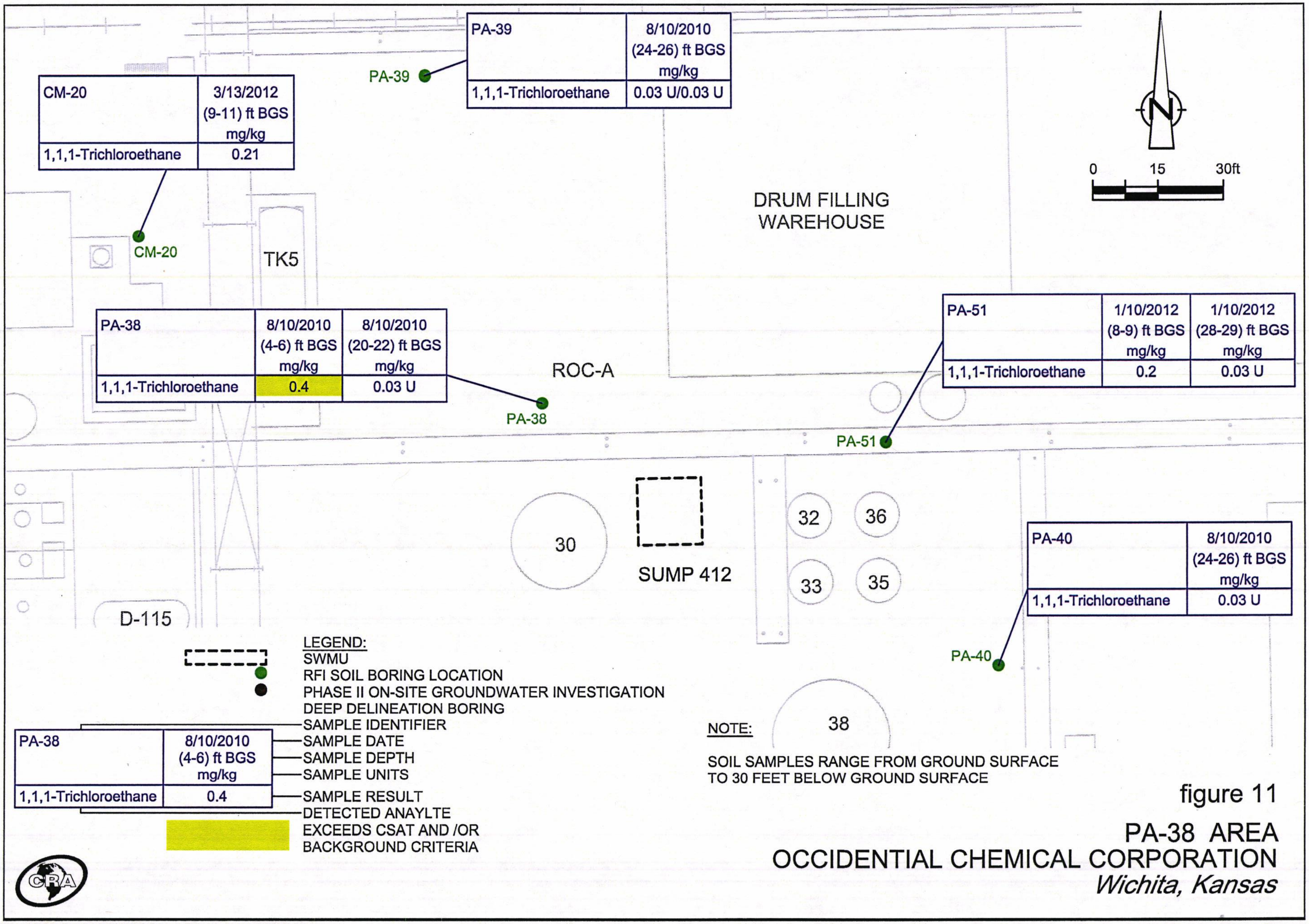
NOTE:

SOIL SAMPLES RANGE FROM GROUND SURFACE TO 30 FEET BELOW GROUND SURFACE

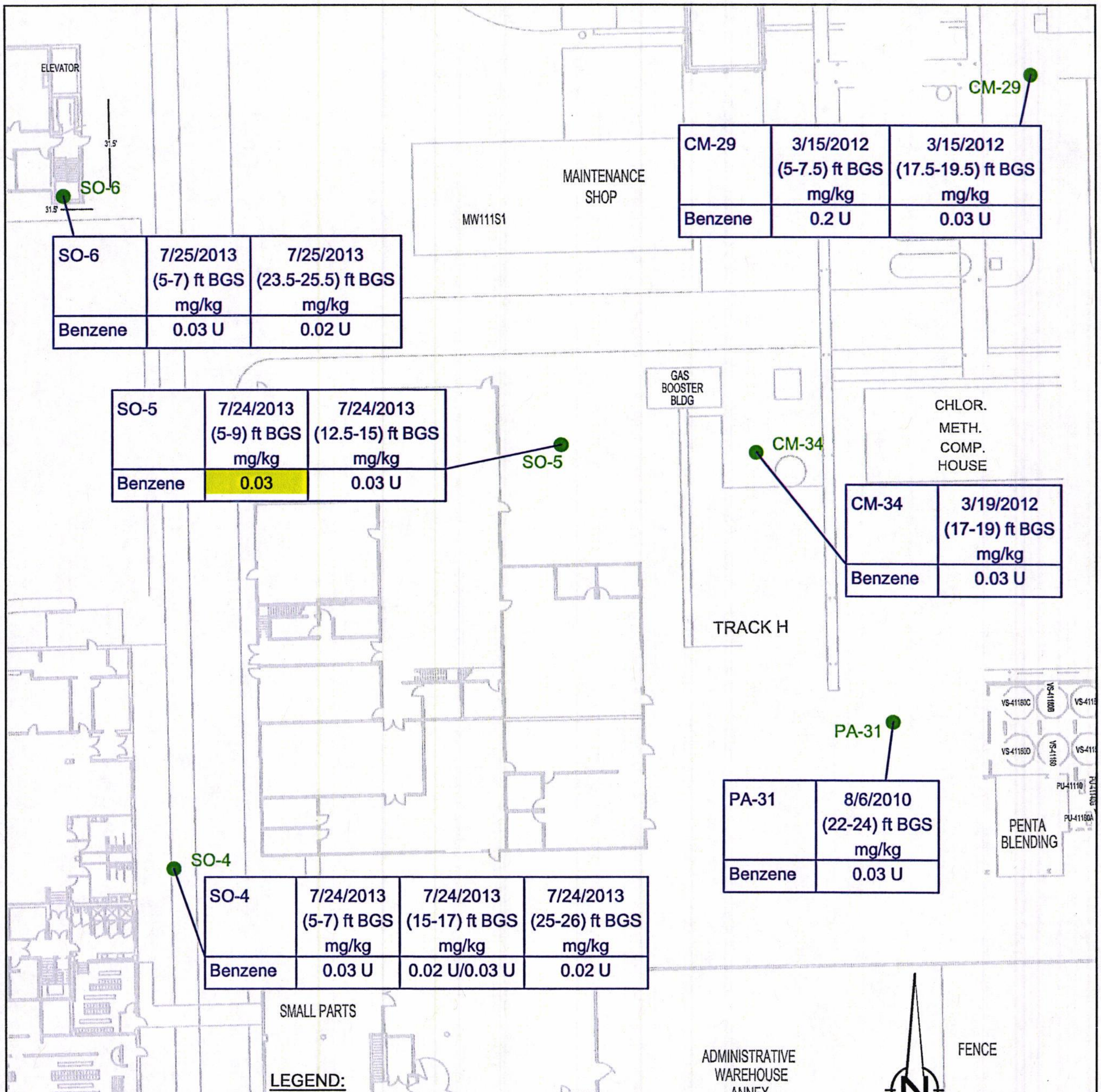
figure 10

CM-43 AREA
OCCIDENTIAL CHEMICAL CORPORATION
Wichita, Kansas

54046-D22105(047)GN-CO010 JUN 19/2014



54046-D22105(047)GN-CO011 JUN 19/2014



SO-6	7/25/2013 (5-7) ft BGS mg/kg	7/25/2013 (23.5-25.5) ft BGS mg/kg
Benzene	0.03 U	0.02 U

CM-29	3/15/2012 (5-7.5) ft BGS mg/kg	3/15/2012 (17.5-19.5) ft BGS mg/kg
Benzene	0.2 U	0.03 U

SO-5	7/24/2013 (5-9) ft BGS mg/kg	7/24/2013 (12.5-15) ft BGS mg/kg
Benzene	0.03	0.03 U

CM-34	3/19/2012 (17-19) ft BGS mg/kg
Benzene	0.03 U

PA-31	8/6/2010 (22-24) ft BGS mg/kg
Benzene	0.03 U

SO-4	7/24/2013 (5-7) ft BGS mg/kg	7/24/2013 (15-17) ft BGS mg/kg	7/24/2013 (25-26) ft BGS mg/kg
Benzene	0.03 U	0.02 U/0.03 U	0.02 U

0 25 50ft

LEGEND:

RFI SOIL BORING LOCATION

PHASE II ON-SITE GROUNDWATER INVESTIGATION DEEP DELINEATION BORING

SO-5	7/24/2013 (5-9) ft BGS mg/kg
Benzene	0.03

SAMPLE IDENTIFIER
SAMPLE DATE
SAMPLE DEPTH
SAMPLE UNITS
SAMPLE RESULT
DETECTED ANAYLTE

EXCEEDS CSAT AND /OR BACKGROUND CRITERIA

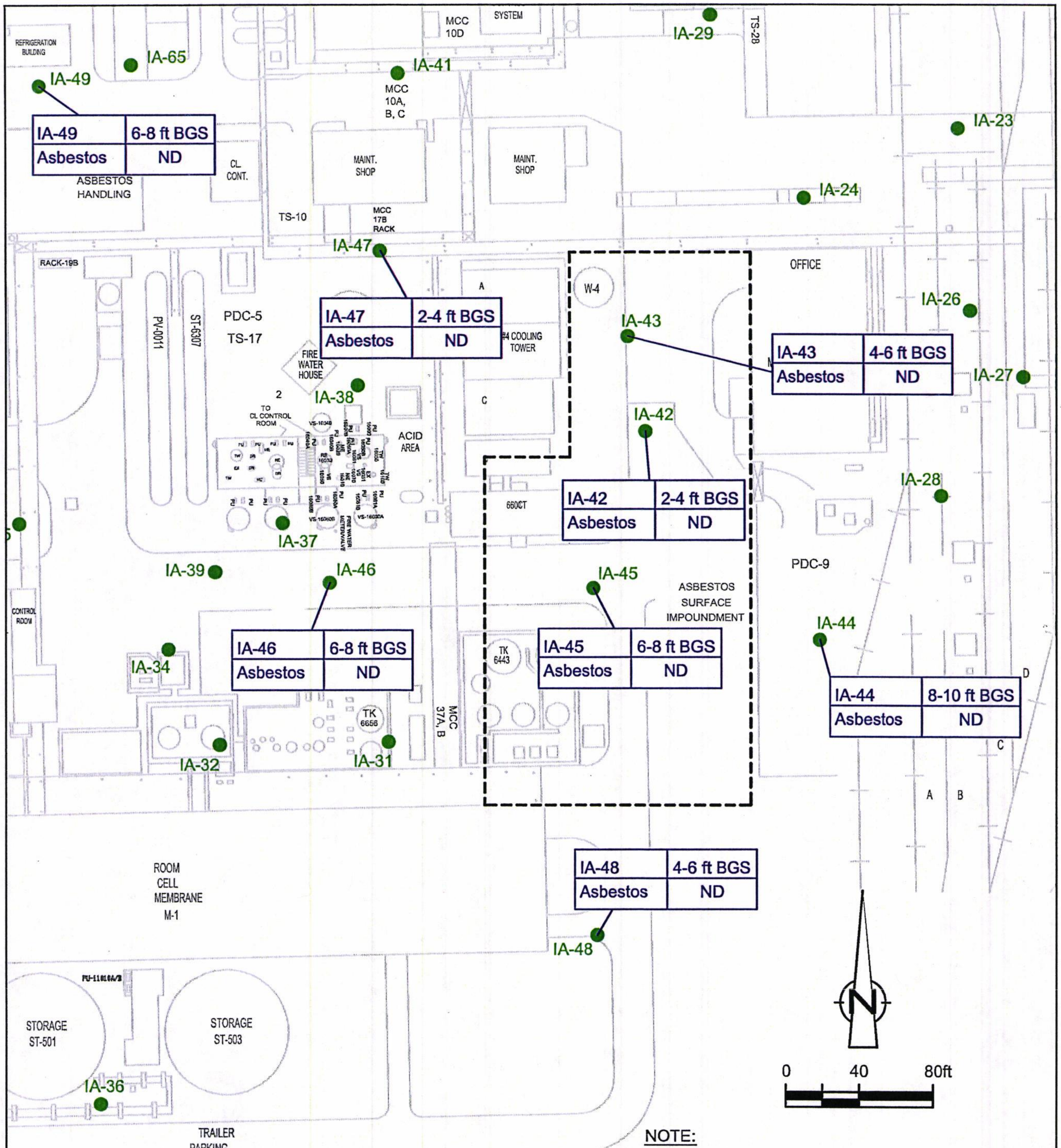
NOTE:

SOIL SAMPLES RANGE FROM GROUND SURFACE TO 30 FEET BELOW GROUND SURFACE

figure 12

SO-5 AREA
OCCIDENTIAL CHEMICAL CORPORATION
Wichita, Kansas

54046-D22105(047)GN-CO012 JUN 19/2014



NOTE:

SOIL SAMPLES RANGE FROM GROUND SURFACE TO 30 FEET BELOW GROUND SURFACE

LEGEND:

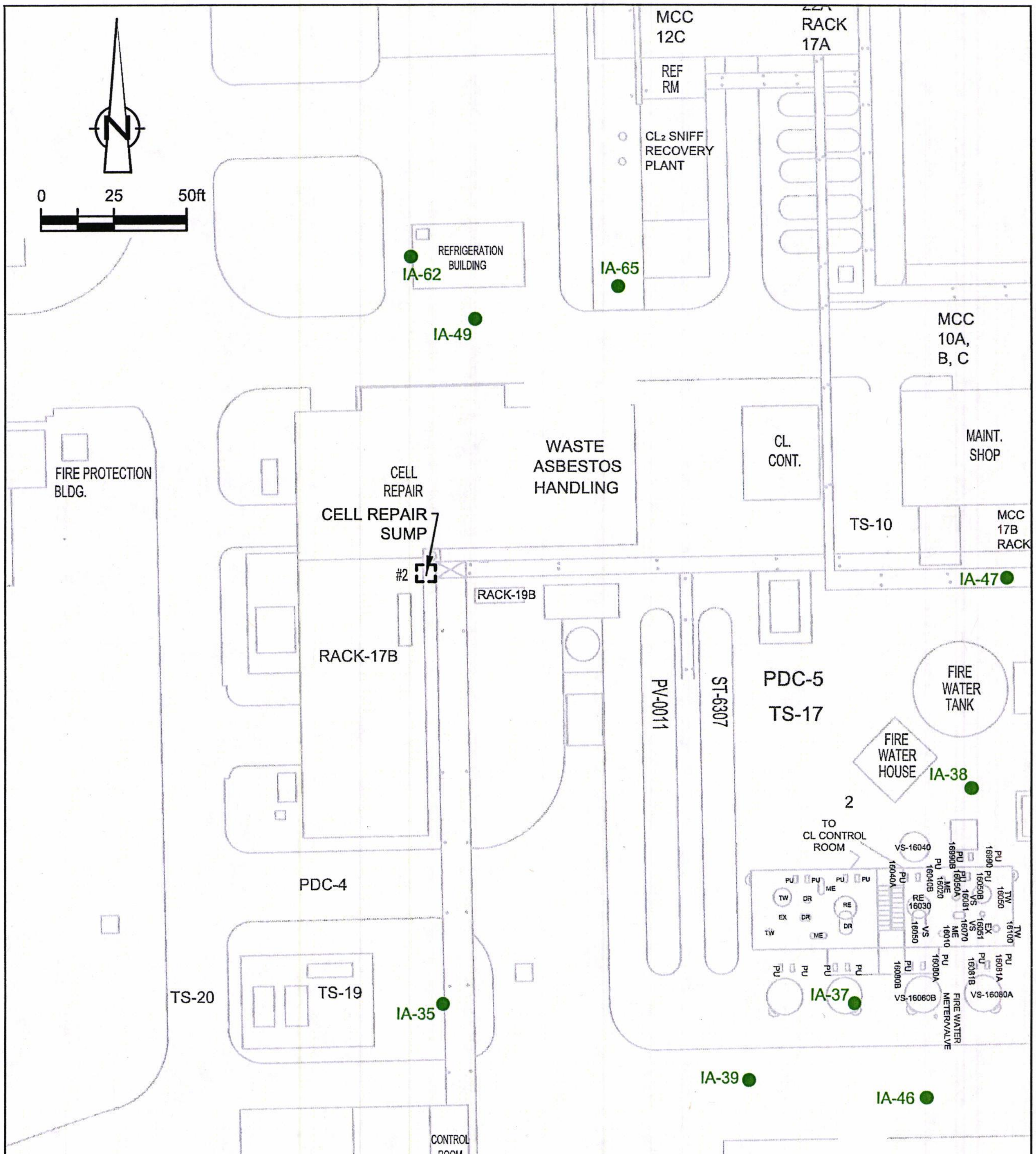
- SWMU, RE: FIGURE 24, PHASE II ON-SITE GROUNDWATER INVESTIGATION RFI SUMMARY REPORT
- RFI SOIL BORING LOCATION
- PHASE II ON-SITE GROUNDWATER INVESTIGATION DEEP DELINEATION BORING

IA-43	4-6 ft BGS
Asbestos	0.02 U/0.02 U

- SAMPLE IDENTIFIER
- SAMPLE DEPTH
- SAMPLE RESULT
- DETECTED ANAYLTE

figure 13

ASBESTOS SURFACE IMPOUNDMENT
OCCIDENTIAL CHEMICAL CORPORATION
Wichita, Kansas



LEGEND:

SUMP

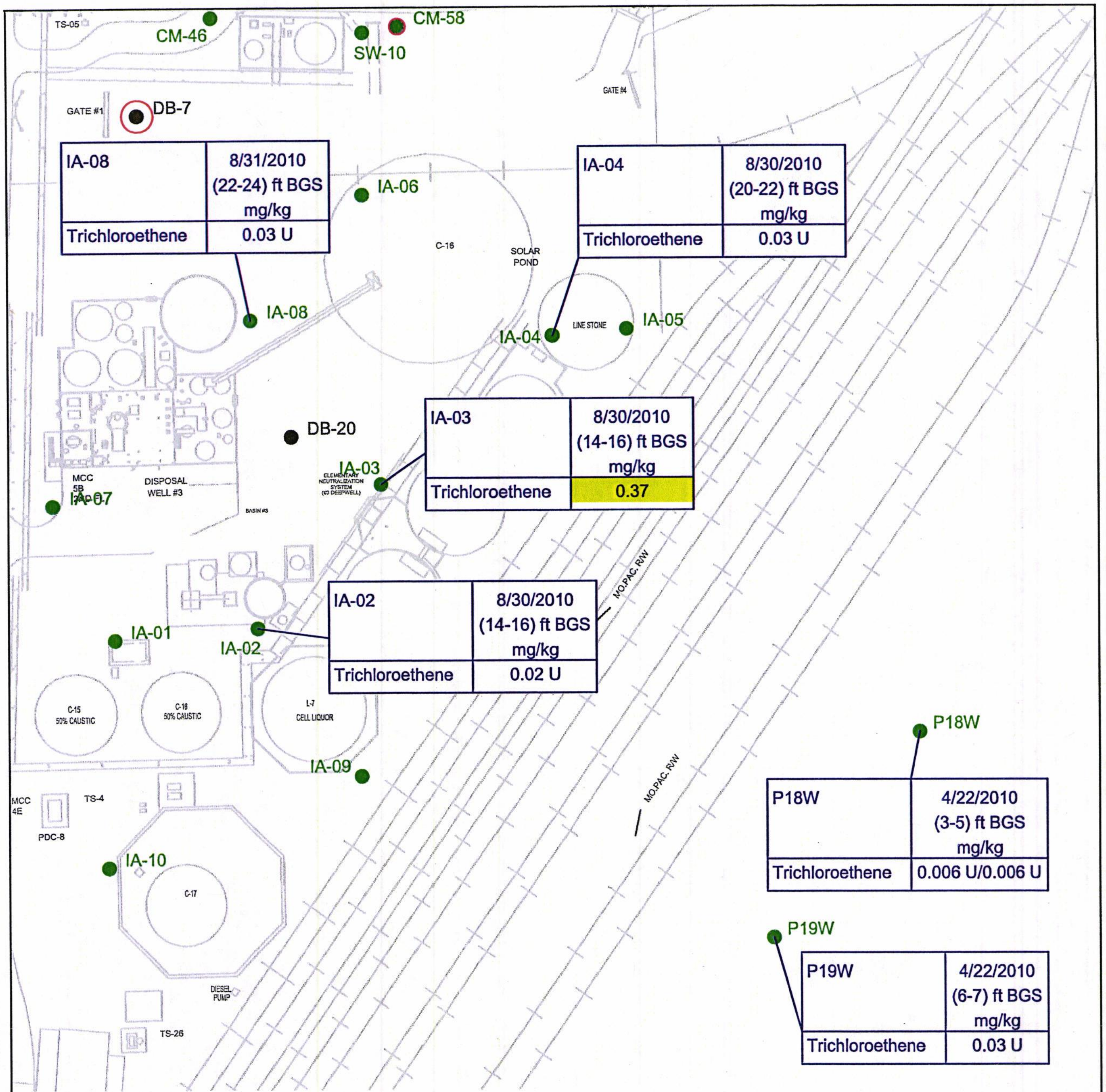
RFI SOIL BORING LOCATION

PHASE II ON-SITE GROUNDWATER INVESTIGATION DEEP DELINEATION BORING

figure 14

CELL REPAIR SUMP
OCCIDENTIAL CHEMICAL CORPORATION
Wichita, Kansas

54046-D22105(047)GN-CO014 JUN 16/2014



LEGEND:

- RFI SOIL BORING LOCATION
- PHASE II ON-SITE GROUNDWATER INVESTIGATION DEEP DELINEATION BORING

IA-03	8/30/2010 (14-16) ft BGS mg/kg
Trichloroethene	0.37

SAMPLE IDENTIFIER
SAMPLE DATE
SAMPLE DEPTH
SAMPLE UNITS
SAMPLE RESULT
DETECTED ANAYLTE

EXCEEDS CSAT AND /OR BACKGROUND CRITERIA

INDICATIONS OF THE PRESENCE OF DNAPL (CSAT EXCEEDENCE OR POSITIVE DYE TEST)

0 50 100ft

NOTE:

SOIL SAMPLES RANGE FROM GROUND SURFACE TO 30 FEET BELOW GROUND SURFACE

figure 15

IA-03 AREA
OCCIDENTIAL CHEMICAL CORPORATION
Wichita, Kansas

54046-D22105(047)GN-CO015 JUN 19/2014

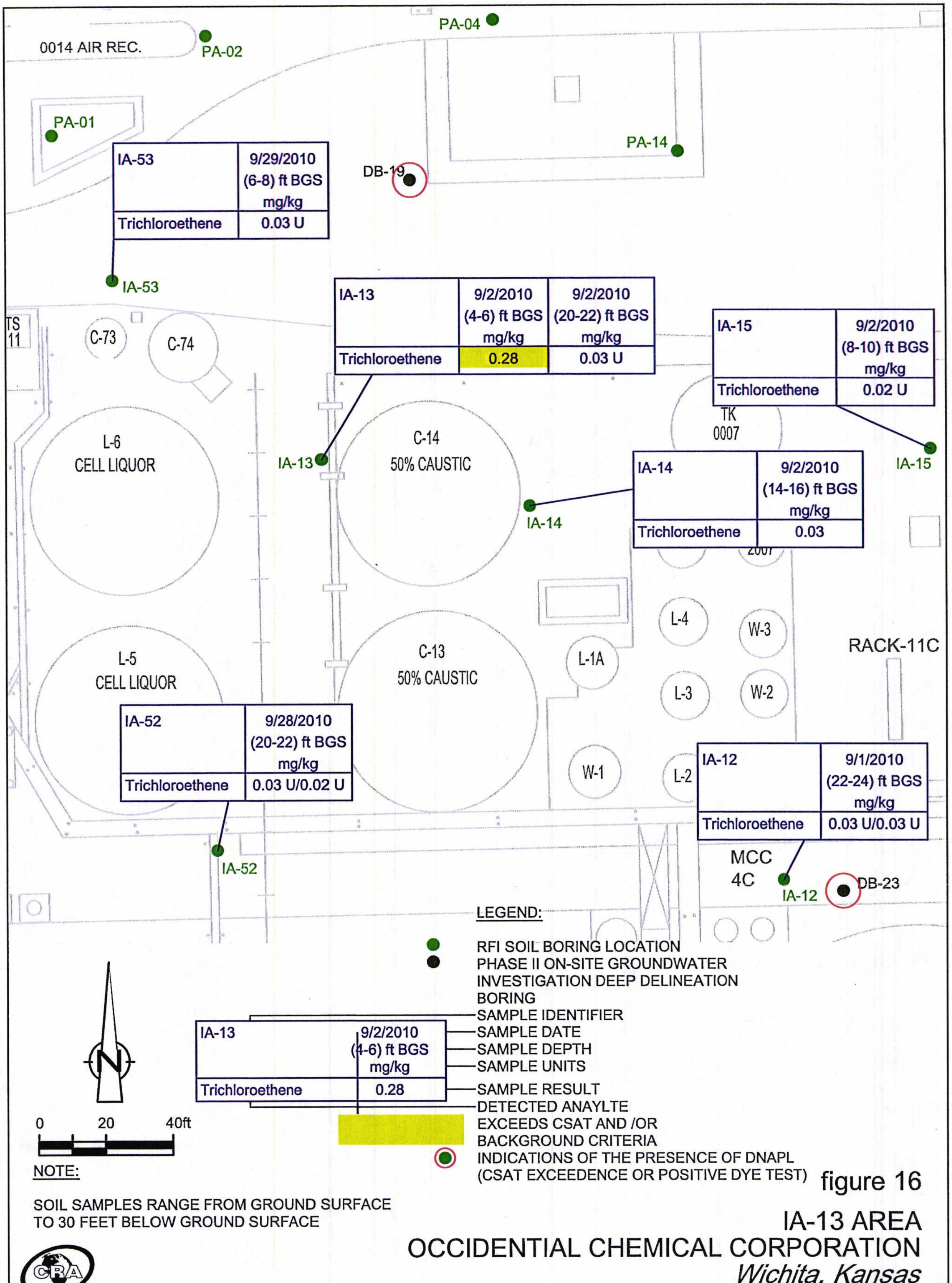


figure 16

IA-13 AREA
OCCIDENTIAL CHEMICAL CORPORATION
Wichita, Kansas

54046-D22105(047)GN-CO016 JUN 19/2014

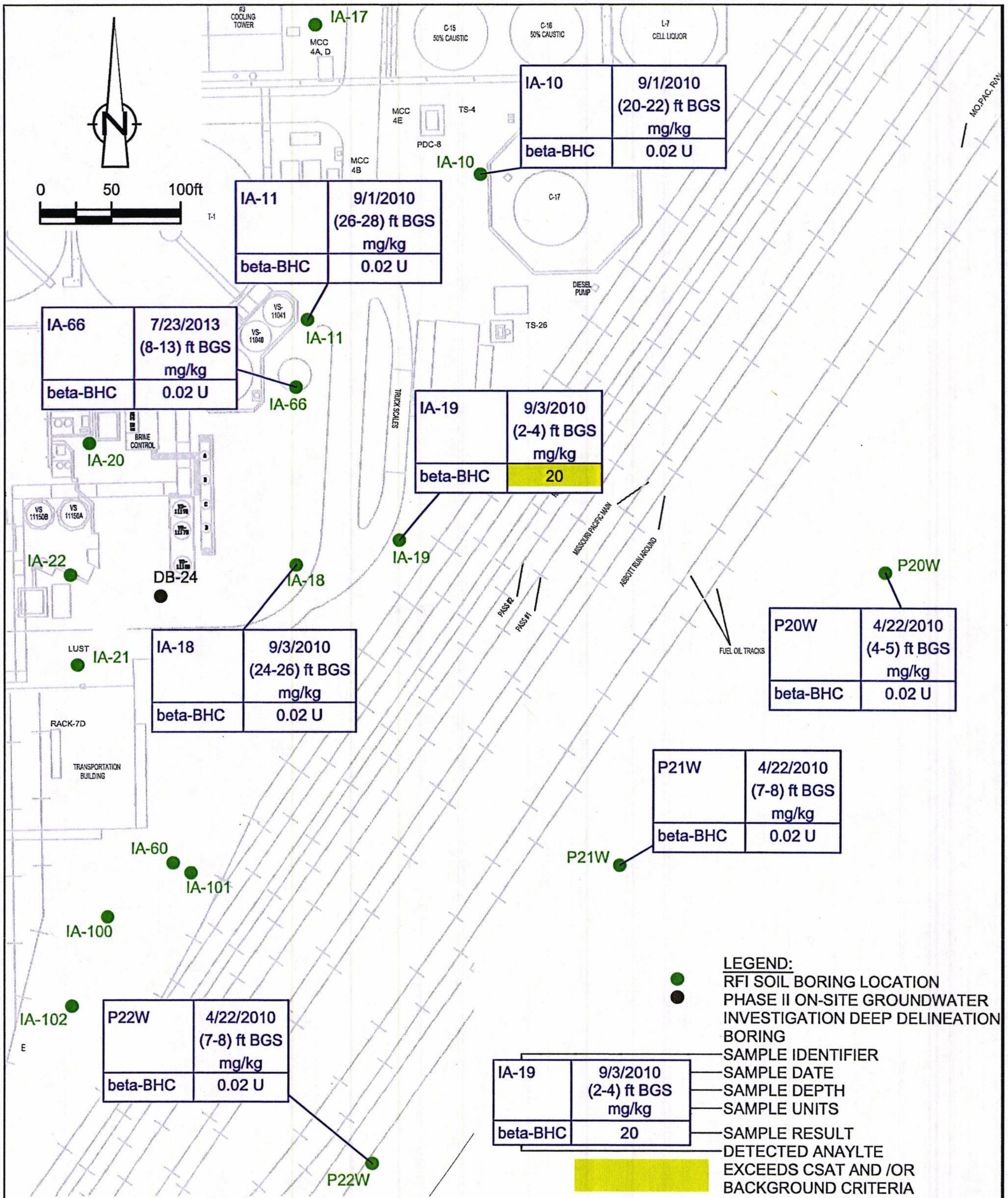


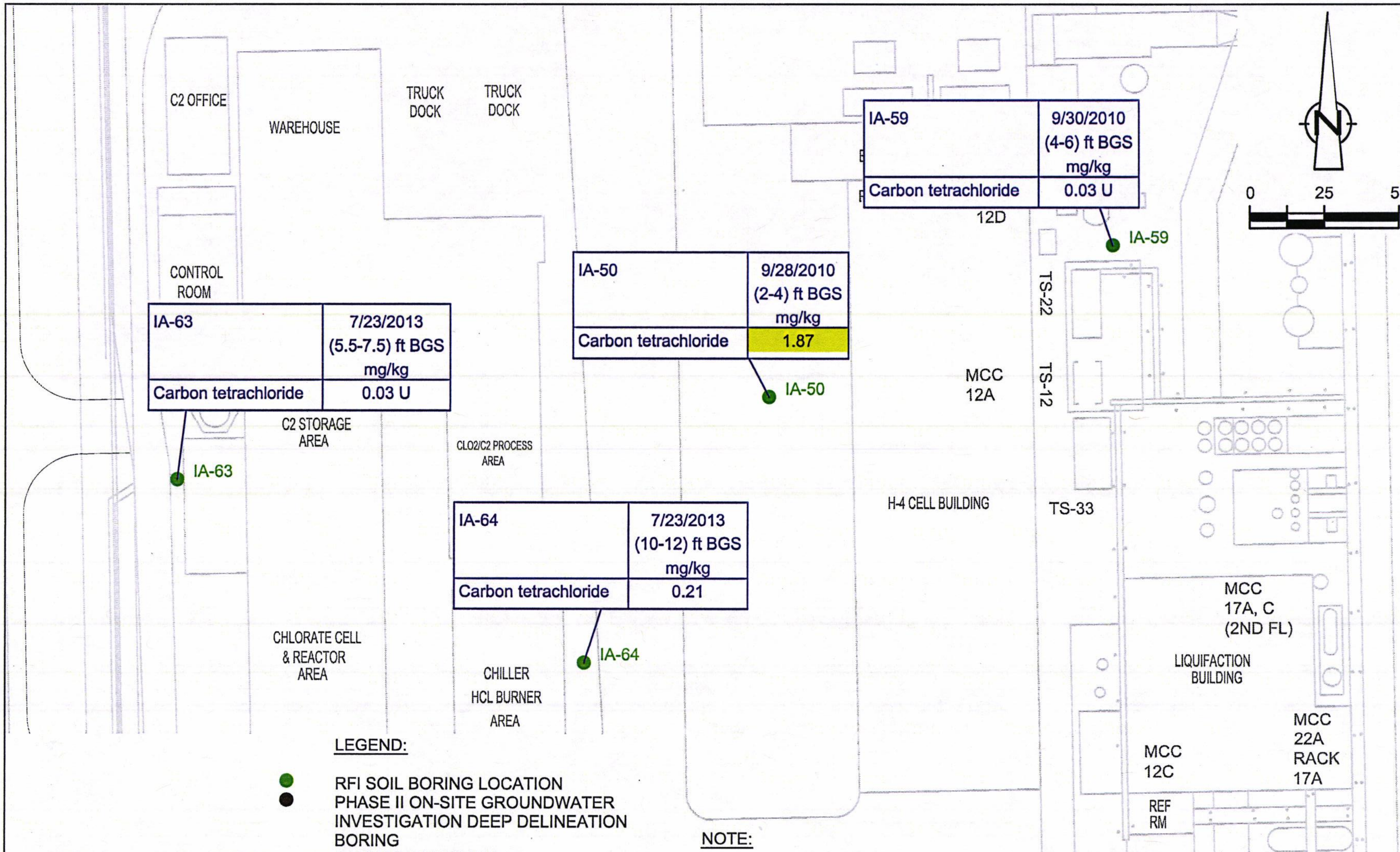
figure 17

IA-19 AREA
OCCIDENTIAL CHEMICAL CORPORATION
Wichita, Kansas

NOTE:

SOIL SAMPLES RANGE FROM GROUND SURFACE
TO 30 FEET BELOW GROUND SURFACE

54046-D22105(047)GN-CO017 JUN 16/2014



LEGEND:

- RFI SOIL BORING LOCATION
- PHASE II ON-SITE GROUNDWATER INVESTIGATION DEEP DELINEATION BORING

IA-50	9/28/2010 (2-4) ft BGS mg/kg
Carbon tetrachloride	1.87

SAMPLE IDENTIFIER
SAMPLE DATE
SAMPLE DEPTH
SAMPLE UNITS
SAMPLE RESULT
DETECTED ANAYLTE
EXCEEDS CSAT AND /OR BACKGROUND CRITERIA

NOTE:

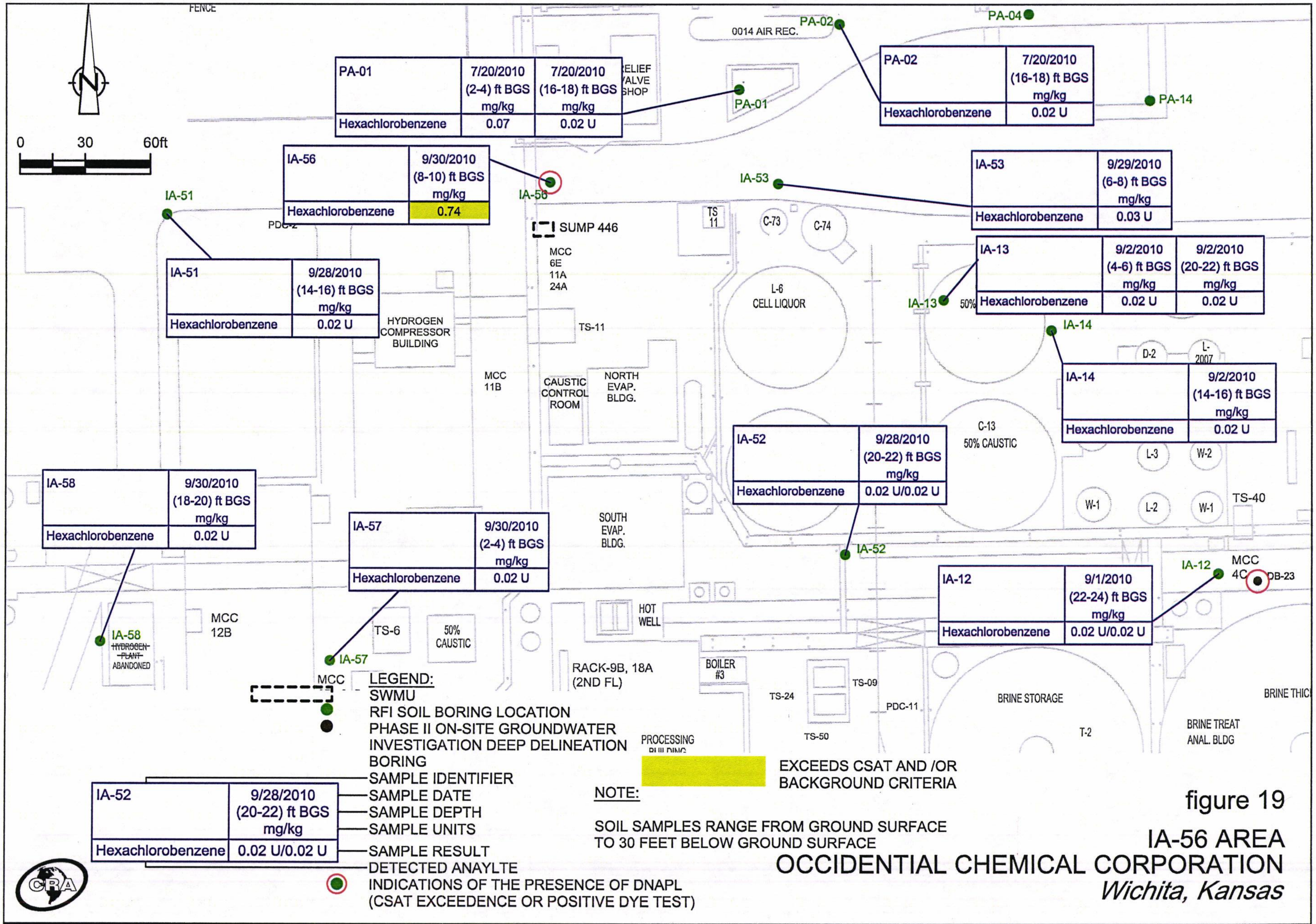
SOIL SAMPLES RANGE FROM GROUND SURFACE TO 30 FEET BELOW GROUND SURFACE

figure 18

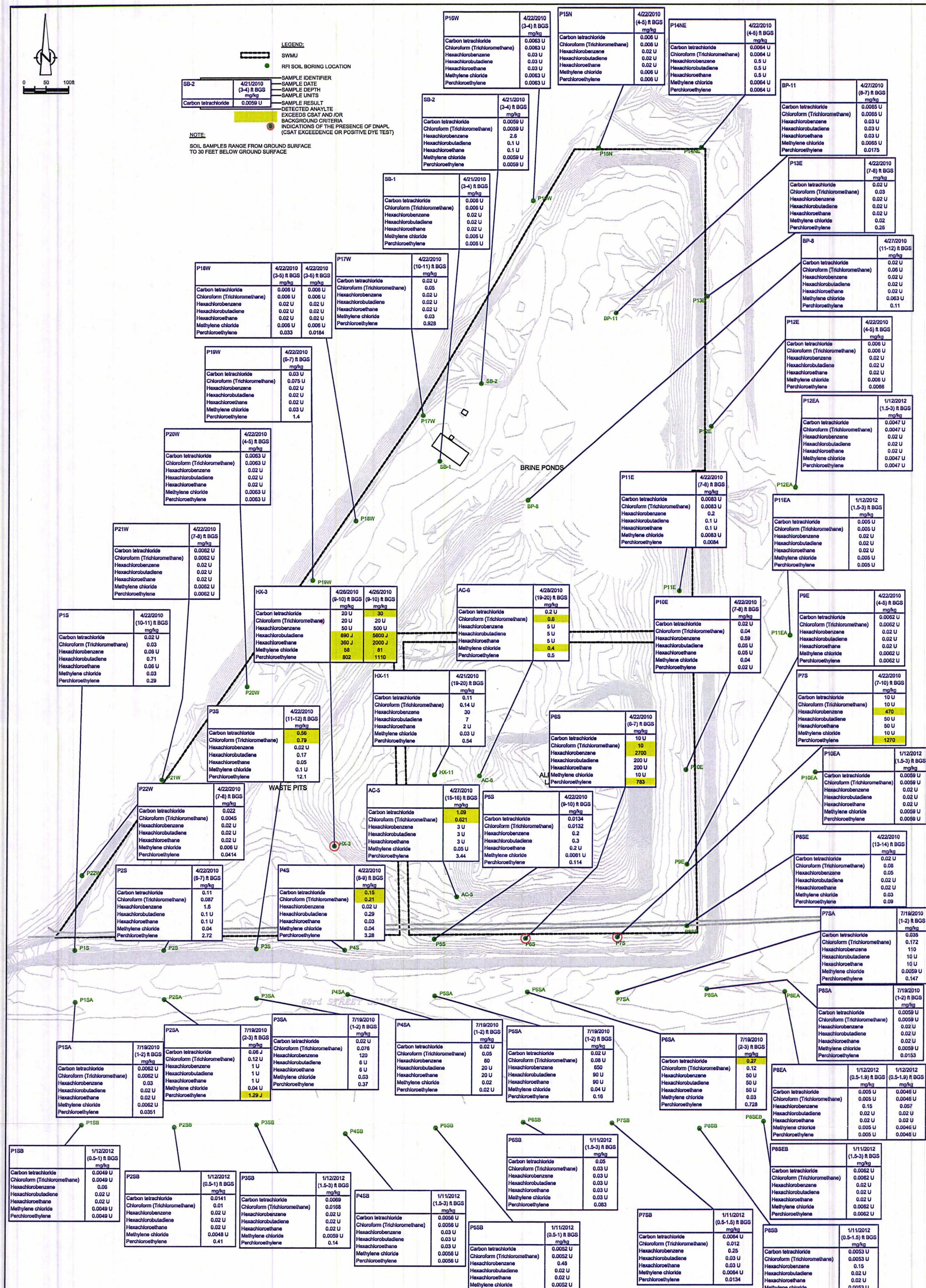
IA-50 AREA
OCCIDENTIAL CHEMICAL CORPORATION
Wichita, Kansas

CRA

54046-D22105(047)GN-CO018 JUN 19/2014



54046-D22105(047)GN-CO019 JUN 16/2014



SB-2	4/21/2010 (3-4) ft BGS mg/kg
Carbon tetrachloride	0.0059 U

P16W	4/22/2010 (3-4) ft BGS mg/kg
Carbon tetrachloride	0.0063 U
Chloroform (Trichloromethane)	0.0063 U
Hexachlorobenzene	0.03 U
Hexachlorobutadiene	0.03 U
Hexachloroethane	0.03 U
Methylene chloride	0.0063 U
Perchloroethylene	0.0063 U

P15N	4/22/2010 (4-5) ft BGS mg/kg
Carbon tetrachloride	0.006 U
Chloroform (Trichloromethane)	0.006 U
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Methylene chloride	0.006 U
Perchloroethylene	0.006 U

P14NE	4/22/2010 (4-5) ft BGS mg/kg
Carbon tetrachloride	0.0064 U
Chloroform (Trichloromethane)	0.0064 U
Hexachlorobenzene	0.5 U
Hexachlorobutadiene	0.5 U
Hexachloroethane	0.5 U
Methylene chloride	0.0064 U
Perchloroethylene	0.0064 U

BP-11	4/27/2010 (6-7) ft BGS mg/kg
Carbon tetrachloride	0.0065 U
Chloroform (Trichloromethane)	0.0065 U
Hexachlorobenzene	0.03 U
Hexachlorobutadiene	0.03 U
Hexachloroethane	0.03 U
Methylene chloride	0.0065 U
Perchloroethylene	0.0175

SB-2	4/21/2010 (3-4) ft BGS mg/kg
Carbon tetrachloride	0.0059 U
Chloroform (Trichloromethane)	0.0059 U
Hexachlorobenzene	2.6
Hexachlorobutadiene	0.1 U
Hexachloroethane	0.1 U
Methylene chloride	0.0059 U
Perchloroethylene	0.0059 U

P13E	4/22/2010 (7-8) ft BGS mg/kg
Carbon tetrachloride	0.02 U
Chloroform (Trichloromethane)	0.03
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Methylene chloride	0.02
Perchloroethylene	0.26

SB-1	4/21/2010 (3-4) ft BGS mg/kg
Carbon tetrachloride	0.006 U
Chloroform (Trichloromethane)	0.006 U
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Methylene chloride	0.006 U
Perchloroethylene	0.006 U

BP-8	4/27/2010 (11-12) ft BGS mg/kg
Carbon tetrachloride	0.02 U
Chloroform (Trichloromethane)	0.06 U
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Methylene chloride	0.063 U
Perchloroethylene	0.11

P18W	4/22/2010 (3-5) ft BGS mg/kg	4/22/2010 (3-5) ft BGS mg/kg
Carbon tetrachloride	0.006 U	0.006 U
Chloroform (Trichloromethane)	0.006 U	0.006 U
Hexachlorobenzene	0.02 U	0.02 U
Hexachlorobutadiene	0.02 U	0.02 U
Hexachloroethane	0.02 U	0.02 U
Methylene chloride	0.006 U	0.006 U
Perchloroethylene	0.033	0.0184

P17W	4/22/2010 (10-11) ft BGS mg/kg
Carbon tetrachloride	0.02 U
Chloroform (Trichloromethane)	0.05
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Methylene chloride	0.03
Perchloroethylene	0.928

P12E	4/22/2010 (4-5) ft BGS mg/kg
Carbon tetrachloride	0.006 U
Chloroform (Trichloromethane)	0.006 U
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Methylene chloride	0.006 U
Perchloroethylene	0.0066

P19W	4/22/2010 (6-7) ft BGS mg/kg
Carbon tetrachloride	0.03 U
Chloroform (Trichloromethane)	0.075 U
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Methylene chloride	0.03 U
Perchloroethylene	1.4

P12EA	1/12/2012 (1.5-3) ft BGS mg/kg
Carbon tetrachloride	0.0047 U
Chloroform (Trichloromethane)	0.0047 U
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Methylene chloride	0.0047 U
Perchloroethylene	0.0047 U

P20W	4/22/2010 (4-5) ft BGS mg/kg
Carbon tetrachloride	0.0063 U
Chloroform (Trichloromethane)	0.0063 U
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Methylene chloride	0.0063 U
Perchloroethylene	0.0063 U

P11E	4/22/2010 (7-8) ft BGS mg/kg
Carbon tetrachloride	0.0083 U
Chloroform (Trichloromethane)	0.0083 U
Hexachlorobenzene	0.2
Hexachlorobutadiene	0.1 U
Hexachloroethane	0.1 U
Methylene chloride	0.0083 U
Perchloroethylene	0.0084

P11EA	1/12/2012 (1.5-3) ft BGS mg/kg
Carbon tetrachloride	0.005 U
Chloroform (Trichloromethane)	0.005 U
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Methylene chloride	0.005 U
Perchloroethylene	0.005 U

P21W	4/22/2010 (7-8) ft BGS mg/kg
Carbon tetrachloride	0.0062 U
Chloroform (Trichloromethane)	0.0062 U
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Methylene chloride	0.0062 U
Perchloroethylene	0.0062 U

HX-3	4/26/2010 (9-10) ft BGS mg/kg	4/26/2010 (9-10) ft BGS mg/kg
Carbon tetrachloride	20 U	30
Chloroform (Trichloromethane)	20 U	20 U
Hexachlorobenzene	50 U	500 U
Hexachlorobutadiene	890 J	5600 J
Hexachloroethane	360 J	2000 J
Methylene chloride	58	81
Perchloroethylene	802	1110

AC-6	4/28/2010 (19-20) ft BGS mg/kg
Carbon tetrachloride	0.2 U
Chloroform (Trichloromethane)	0.6
Hexachlorobenzene	5 U
Hexachlorobutadiene	5 U
Hexachloroethane	5 U
Methylene chloride	0.4
Perchloroethylene	0.5

P10E	4/22/2010 (7-8) ft BGS mg/kg
Carbon tetrachloride	0.02 U
Chloroform (Trichloromethane)	0.04
Hexachlorobenzene	0.59
Hexachlorobutadiene	0.05 U
Hexachloroethane	0.05 U
Methylene chloride	0.04
Perchloroethylene	0.02 U

P9E	4/22/2010 (4-5) ft BGS mg/kg
Carbon tetrachloride	0.0062 U
Chloroform (Trichloromethane)	0.0062 U
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Methylene chloride	0.0062 U
Perchloroethylene	0.0062 U

P1S	4/22/2010 (10-11) ft BGS mg/kg
Carbon tetrachloride	0.02 U
Chloroform (Trichloromethane)	0.03
Hexachlorobenzene	0.06 U
Hexachlorobutadiene	0.71
Hexachloroethane	0.06 U
Methylene chloride	0.03
Perchloroethylene	0.29

HX-11	4/21/2010 (19-20) ft BGS mg/kg
Carbon tetrachloride	0.11
Chloroform (Trichloromethane)	0.14 U
Hexachlorobenzene	30
Hexachlorobutadiene	7
Hexachloroethane	2 U
Methylene chloride	0.03 U
Perchloroethylene	0.54

P7S	4/22/2010 (7-10) ft BGS mg/kg
Carbon tetrachloride	10 U
Chloroform (Trichloromethane)	10 U
Hexachlorobenzene	470
Hexachlorobutadiene	50 U
Hexachloroethane	50 U
Methylene chloride	10 U
Perchloroethylene	1270

P3S	4/22/2010 (11-12) ft BGS mg/kg
Carbon tetrachloride	0.56
Chloroform (Trichloromethane)	0.79
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.17
Hexachloroethane	0.05
Methylene chloride	0.1 U
Perchloroethylene	12.1

P6S	4/22/2010 (6-7) ft BGS mg/kg
Carbon tetrachloride	10 U
Chloroform (Trichloromethane)	10
Hexachlorobenzene	2700
Hexachlorobutadiene	200 U
Hexachloroethane	200 U
Methylene chloride	10 U
Perchloroethylene	783

P10EA	1/12/2012 (1.5-3) ft BGS mg/kg
Carbon tetrachloride	0.0059 U
Chloroform (Trichloromethane)	0.0059 U
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Methylene chloride	0.0059 U
Perchloroethylene	0.0059 U

P22W	4/22/2010 (7-8) ft BGS mg/kg
Carbon tetrachloride	0.022
Chloroform (Trichloromethane)	0.0045
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Methylene chloride	0.006 U
Perchloroethylene	0.0414

AC-5	4/27/2010 (15-16) ft BGS mg/kg
Carbon tetrachloride	1.09
Chloroform (Trichloromethane)	0.621
Hexachlorobenzene	3 U
Hexachlorobutadiene	3 U
Hexachloroethane	3 U
Methylene chloride	0.05 U
Perchloroethylene	3.44

P5S	4/22/2010 (9-10) ft BGS mg/kg
Carbon tetrachloride	0.0134
Chloroform (Trichloromethane)	0.0132
Hexachlorobenzene	0.2
Hexachlorobutadiene	0.3
Hexachloroethane	0.2 U
Methylene chloride	0.0061 U
Perchloroethylene	0.114

P8SE	4/22/2010 (13-14) ft BGS mg/kg
Carbon tetrachloride	0.02 U
Chloroform (Trichloromethane)	0.08
Hexachlorobenzene	0.05
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Methylene chloride	0.03
Perchloroethylene	0.09

P2S	4/22/2010 (6-7) ft BGS mg/kg
Carbon tetrachloride	0.11
Chloroform (Trichloromethane)	0.087
Hexachlorobenzene	1.6
Hexachlorobutadiene	0.1 U
Hexachloroethane	0.1 U
Methylene chloride	0.04
Perchloroethylene	2.72

P4S	4/22/2010 (8-9) ft BGS mg/kg
Carbon tetrachloride	0.15
Chloroform (Trichloromethane)	0.21
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.29
Hexachloroethane	0.03
Methylene chloride	0.04
Perchloroethylene	3.28

P7SA	7/19/2010 (1-2) ft BGS mg/kg
Carbon tetrachloride	0.035
Chloroform (Trichloromethane)	0.172
Hexachlorobenzene	110
Hexachlorobutadiene	10 U
Hexachloroethane	10 U
Methylene chloride	0.0059 U
Perchloroethylene	0.147

P8SA	7/19/2010 (1-2) ft BGS mg/kg
Carbon tetrachloride	0.0059 U
Chloroform (Trichloromethane)	0.0059 U
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Methylene chloride	0.0059 U
Perchloroethylene	0.0153

P3SA	7/19/2010 (1-2) ft BGS mg/kg
Carbon tetrachloride	0.02 U
Chloroform (Trichloromethane)	0.076
Hexachlorobenzene	120
Hexachlorobutadiene	6 U
Hexachloroethane	6 U
Methylene chloride	0.03
Perchloroethylene	0.37

P2SA	7/19/2010 (2-3) ft BGS mg/kg
Carbon tetrachloride	0.06 J
Chloroform (Trichloromethane)	0.12 U
Hexachlorobenzene	1 U
Hexachlorobutadiene	1 U
Hexachloroethane	1 U
Methylene chloride	0.04 U
Perchloroethylene	1.29 J

P4SA	7/19/2010 (1-2) ft BGS mg/kg
Carbon tetrachloride	0.02 U
Chloroform (Trichloromethane)	0.05
Hexachlorobenzene	60
Hexachlorobutadiene	20 U
Hexachloroethane	20 U
Methylene chloride	0.02
Perchloroethylene	0.02 U

P5SA	7/19/2010 (1-2) ft BGS mg/kg
Carbon tetrachloride	0.02 U
Chloroform (Trichloromethane)	0.08 U
Hexachlorobenzene	650
Hexachlorobutadiene	90 U
Hexachloroethane	90 U
Methylene chloride	0.04 U
Perchloroethylene	0.16

P6SA	7/19/2010 (2-3) ft BGS mg/kg
Carbon tetrachloride	0.27
Chloroform (Trichloromethane)	0.12
Hexachlorobenzene	50 U
Hexachlorobutadiene	50 U
Hexachloroethane	50 U
Methylene chloride	0.03
Perchloroethylene	0.728

P1SA	7/19/2010 (1-2) ft BGS mg/kg
Carbon tetrachloride	0.0062 U
Chloroform (Trichloromethane)	0.0062 U
Hexachlorobenzene	0.03
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Methylene chloride	0.0062 U
Perchloroethylene	0.0351

P8EA	1/12/2012 (0.5-1.9) ft BGS mg/kg	1/12/2012 (0.5-1.9) ft BGS mg/kg
Carbon tetrachloride	0.005 U	0.0046 U
Chloroform (Trichloromethane)	0.005 U	0.0046 U
Hexachlorobenzene	0.15	0.057
Hexachlorobutadiene	0.02 U	0.02 U
Hexachloroethane	0.02 U	0.02 U
Methylene chloride	0.005 U	0.0046 U
Perchloroethylene	0.005 U	0.0046 U

P6SB	1/11/2012 (1.5-3) ft BGS mg/kg
Carbon tetrachloride	0.05
Chloroform (Trichloromethane)	0.03 U
Hexachlorobenzene	0.03 U
Hexachlorobutadiene	0.03 U
Hexachloroethane	0.03 U
Methylene chloride	0.03 U
Perchloroethylene	0.083

P1SB	1/12/2012 (0.5-1) ft BGS mg/kg
Carbon tetrachloride	0.0049 U
Chloroform (Trichloromethane)	0.0049 U
Hexachlorobenzene	0.06
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Methylene chloride	0.0049 U
Perchloroethylene	0.0049 U

P8SEB	1/11/2012 (1.5-3) ft BGS mg/kg
Carbon tetrachloride	0.0062 U
Chloroform (Trichloromethane)	0.0062 U
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Methylene chloride	0.0062 U
Perchloroethylene	0.0062 U

P2SB	1/12/2012 (0.5-1) ft BGS mg/kg
Carbon tetrachloride	0.0141
Chloroform (Trichloromethane)	0.01
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Methylene chloride	0.0048 U
Perchloroethylene	0.41

P3SB	1/12/2012 (1.5-3) ft BGS mg/kg
Carbon tetrachloride	0.0069
Chloroform (Trichloromethane)	0.0168
Hexachlorobenzene	0.02 U
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Methylene chloride	0.0059 U
Perchloroethylene	0.14

P4SB	1/11/2012 (1.5-3) ft BGS mg/kg
Carbon tetrachloride	0.0056 U
Chloroform (Trichloromethane)	0.0056 U
Hexachlorobenzene	0.03 U
Hexachlorobutadiene	0.03 U
Hexachloroethane	0.03 U
Methylene chloride	0.0056 U
Perchloroethylene	0.0056 U

P7SB	1/11/2012 (0.5-1.5) ft BGS mg/kg
Carbon tetrachloride	0.0064 U
Chloroform (Trichloromethane)	0.012
Hexachlorobenzene	0.25
Hexachlorobutadiene	0.03 U
Hexachloroethane	0.03 U
Methylene chloride	0.0064 U
Perchloroethylene	0.0134

P5SB	1/11/2012 (0.5-1) ft BGS mg/kg
Carbon tetrachloride	0.0052 U
Chloroform (Trichloromethane)	0.0052 U
Hexachlorobenzene	0.48
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Methylene chloride	0.0052 U
Perchloroethylene	0.0052 U

P8SB	1/11/2012 (0.5-1.5) ft BGS mg/kg
Carbon tetrachloride	0.0053 U
Chloroform (Trichloromethane)	0.0053 U
Hexachlorobenzene	0.15
Hexachlorobutadiene	0.02 U
Hexachloroethane	0.02 U
Methylene chloride	0.0053 U
Perchloroethylene	0.0053 U

Nº	Revision	Date	Initial

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

OCC WICHITA
WICHITA, KANSAS

CONESTOGA-ROVERS & ASSOCIATES

Source Reference:

LANDFILL AREA ANALYTICAL SUMMARY

BRINE PONDS, HEX WASTE PITS, AND ALPHA CAKE LANDFILL

Project Manager:	Reviewed By:	Date:	
B. CLEGG	M. KEPPEL	6/11/14	
Scale:	Project Nº:	Report Nº:	Drawing Nº:
1:100	54046-D22105	047	figure 20

54046-D22105(047)GN-CO020 JUN 19/2014

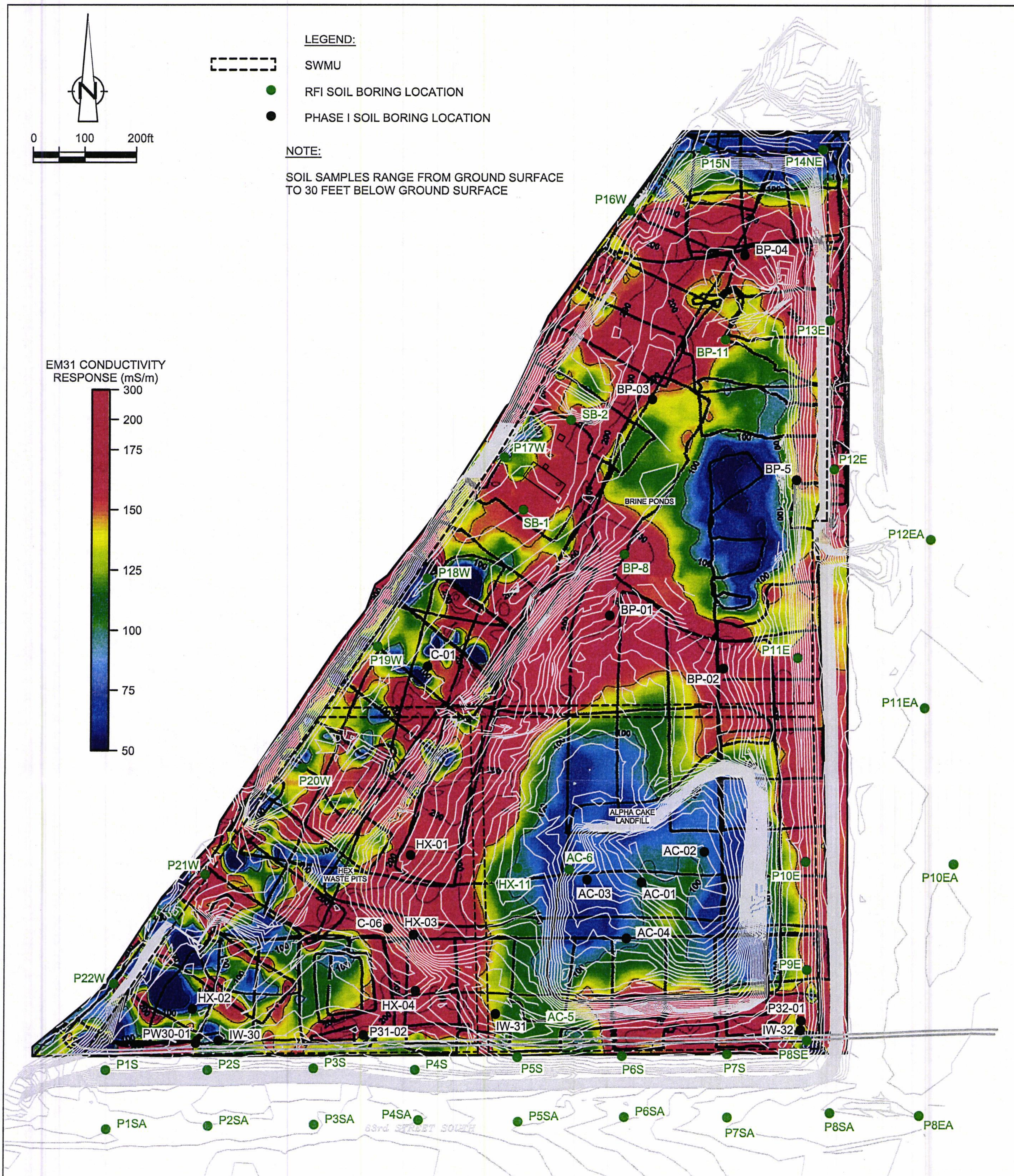


figure 21

LANDFILL AREA GEOPHYSICS
OCCIDENTIAL CHEMICAL CORPORATION
Wichita, Kansas

54046-D22105(047)GN-CO021 JUN 18/2014

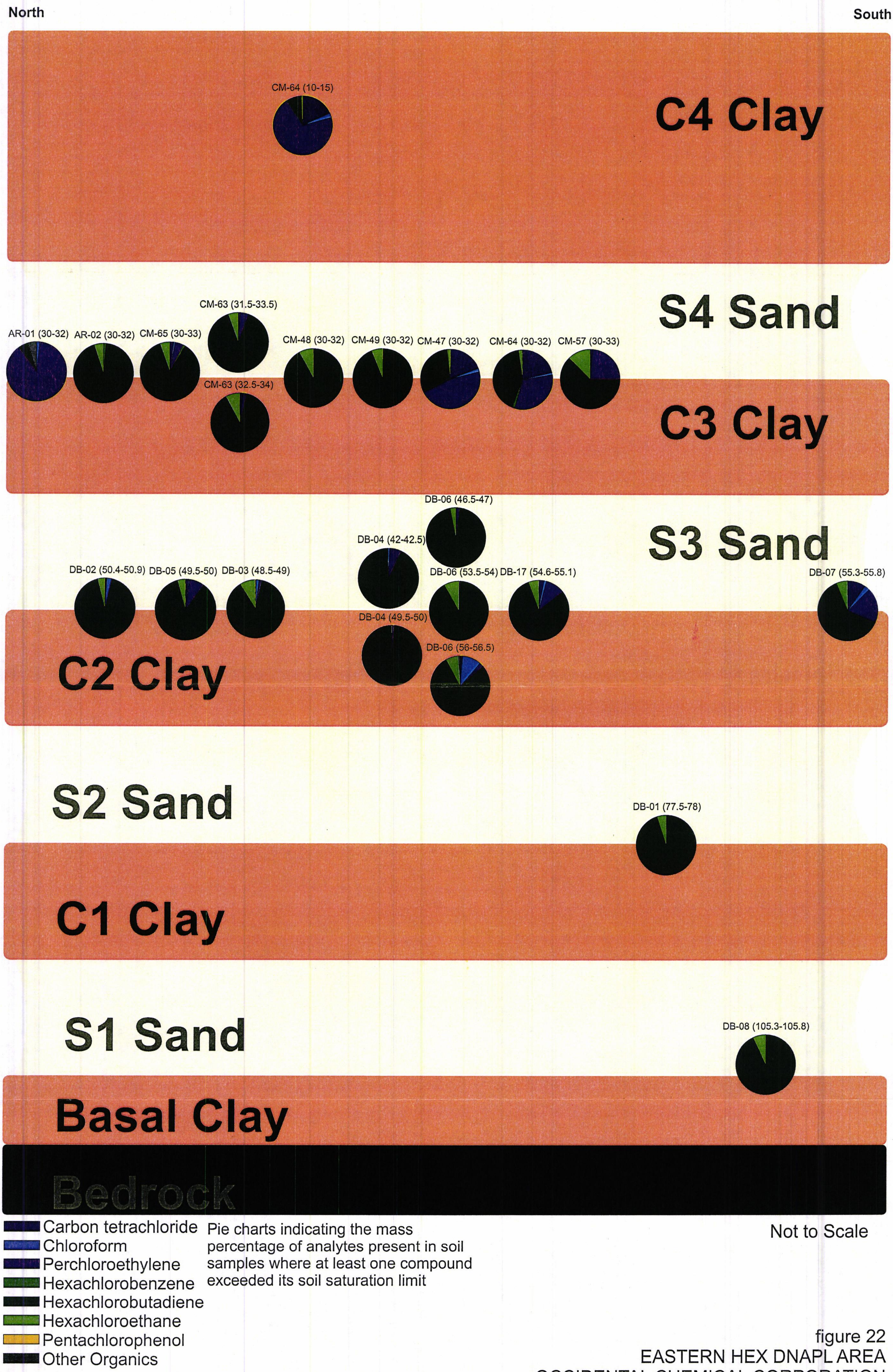
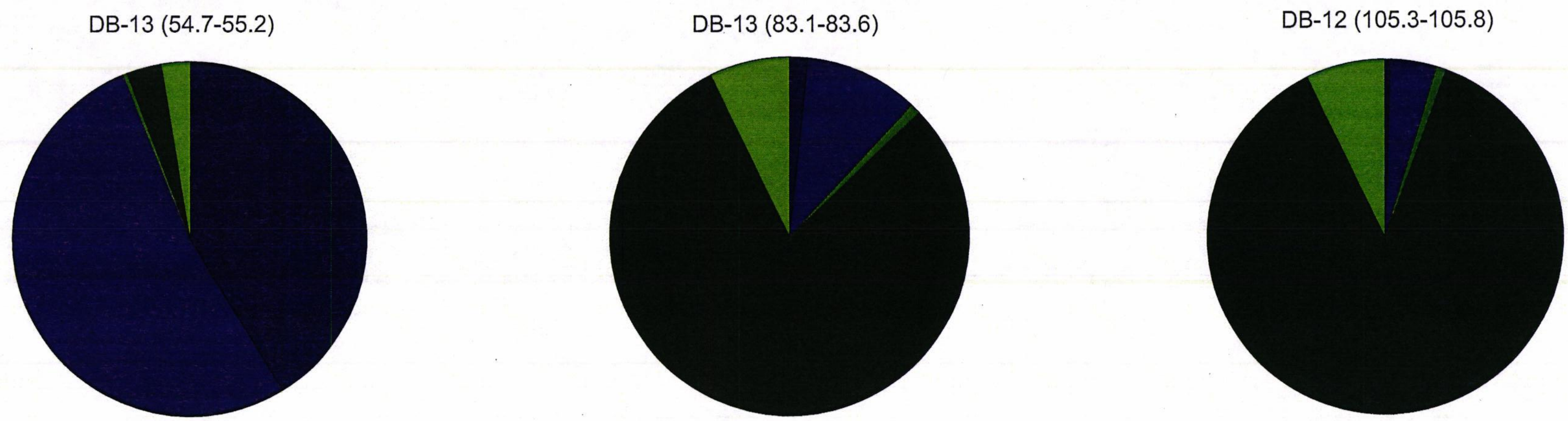


figure 22
EASTERN HEX DNAPL AREA
OCCIDENTAL CHEMICAL CORPORATION
Wichita, Kansas

054046(047)GIS-CO001



Carbon tetrachloride
Chloroform
Perchloroethylene
Hexachlorobenzene
Hexachlorobutadiene
Hexachloroethane
Pentachlorophenol
Other Organics

figure 23
NORTHWEST HEX DNAPL AREA
OCCIDENTAL CHEMICAL CORPORATION
Wichita, Kansas

054046(047)GIS-CO002

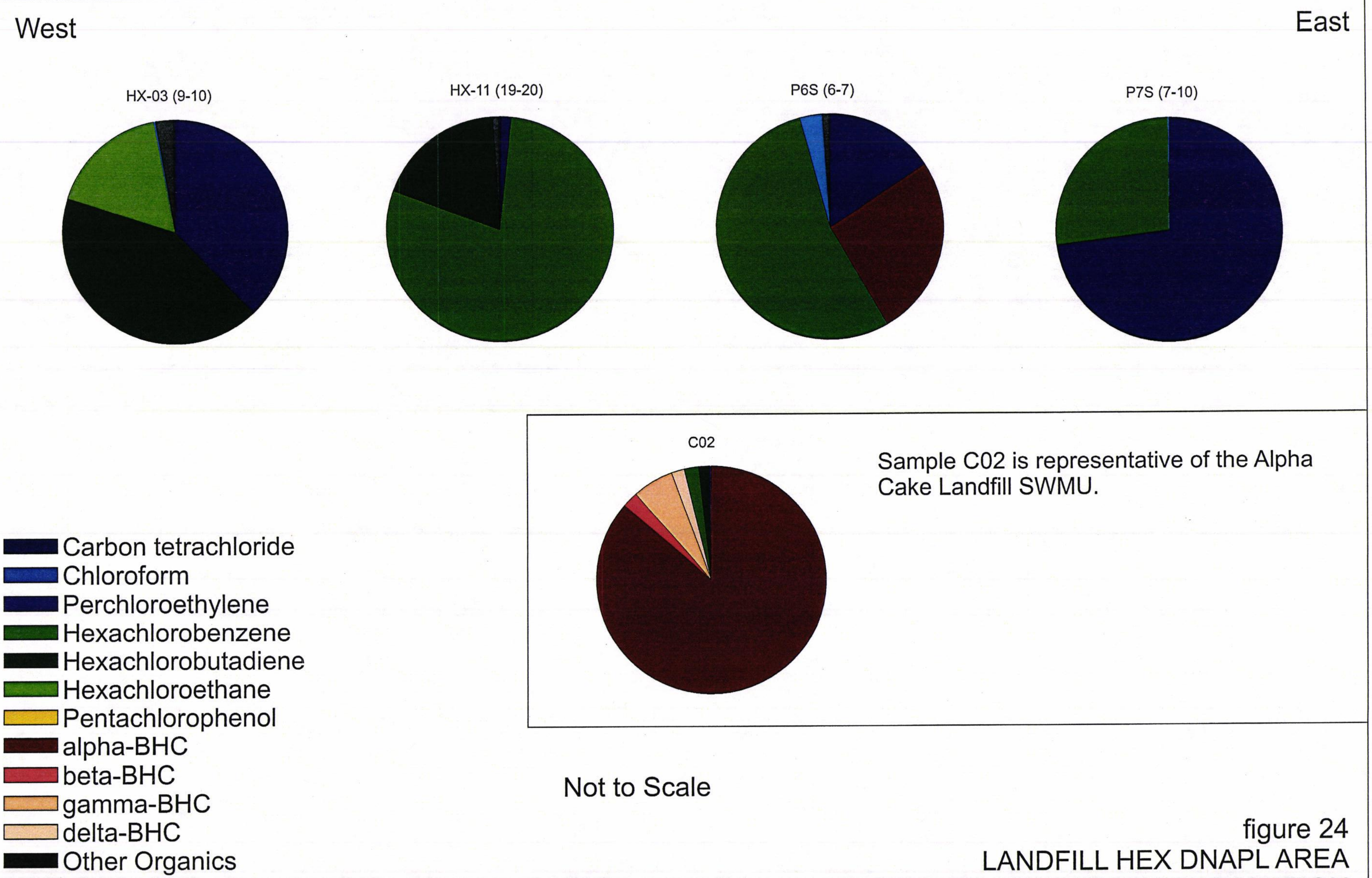
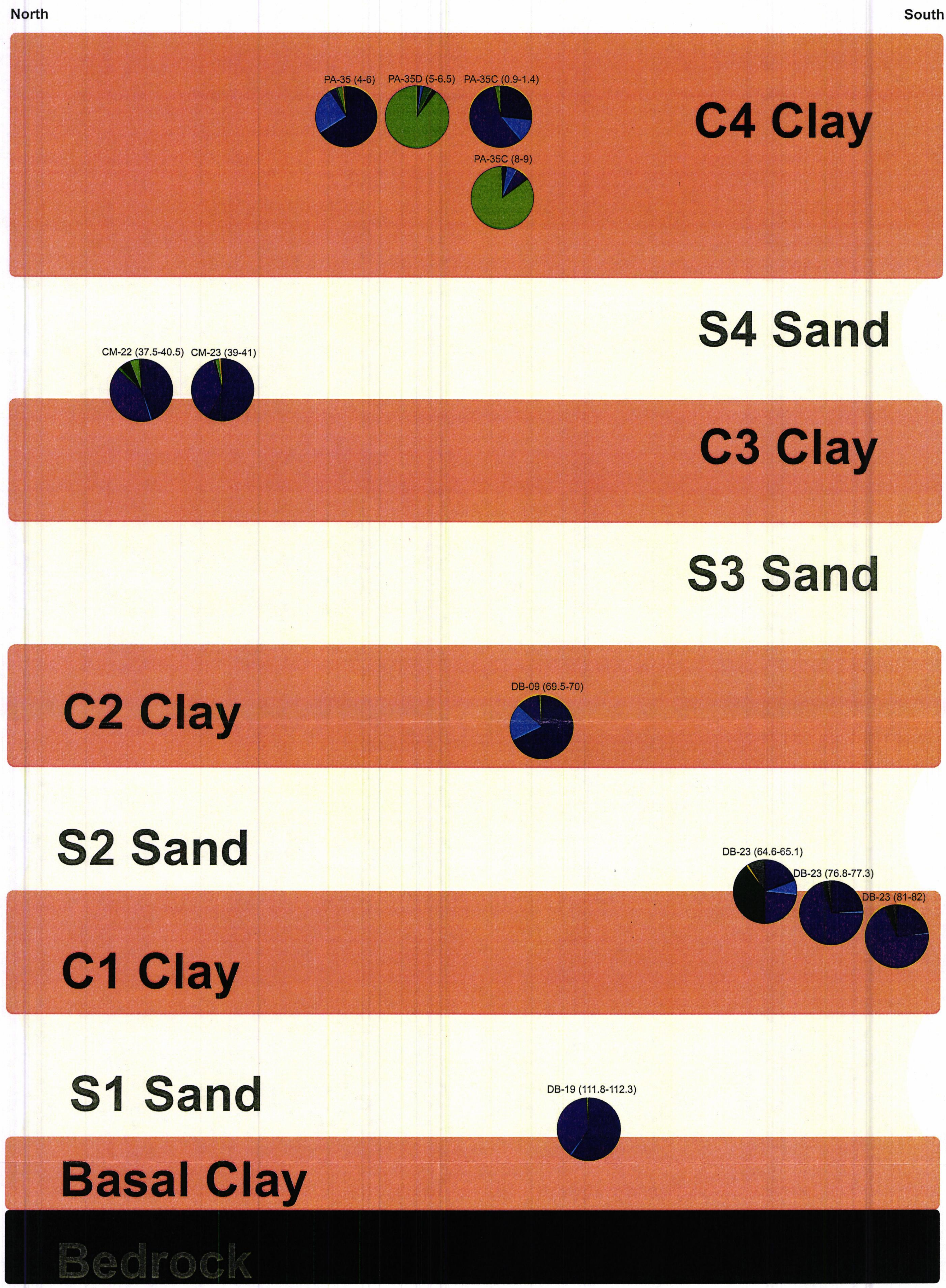


figure 24
LANDFILL HEX DNAPL AREA
OCCIDENTAL CHEMICAL CORPORATION
Wichita, Kansas

054046(047)GIS-CO002



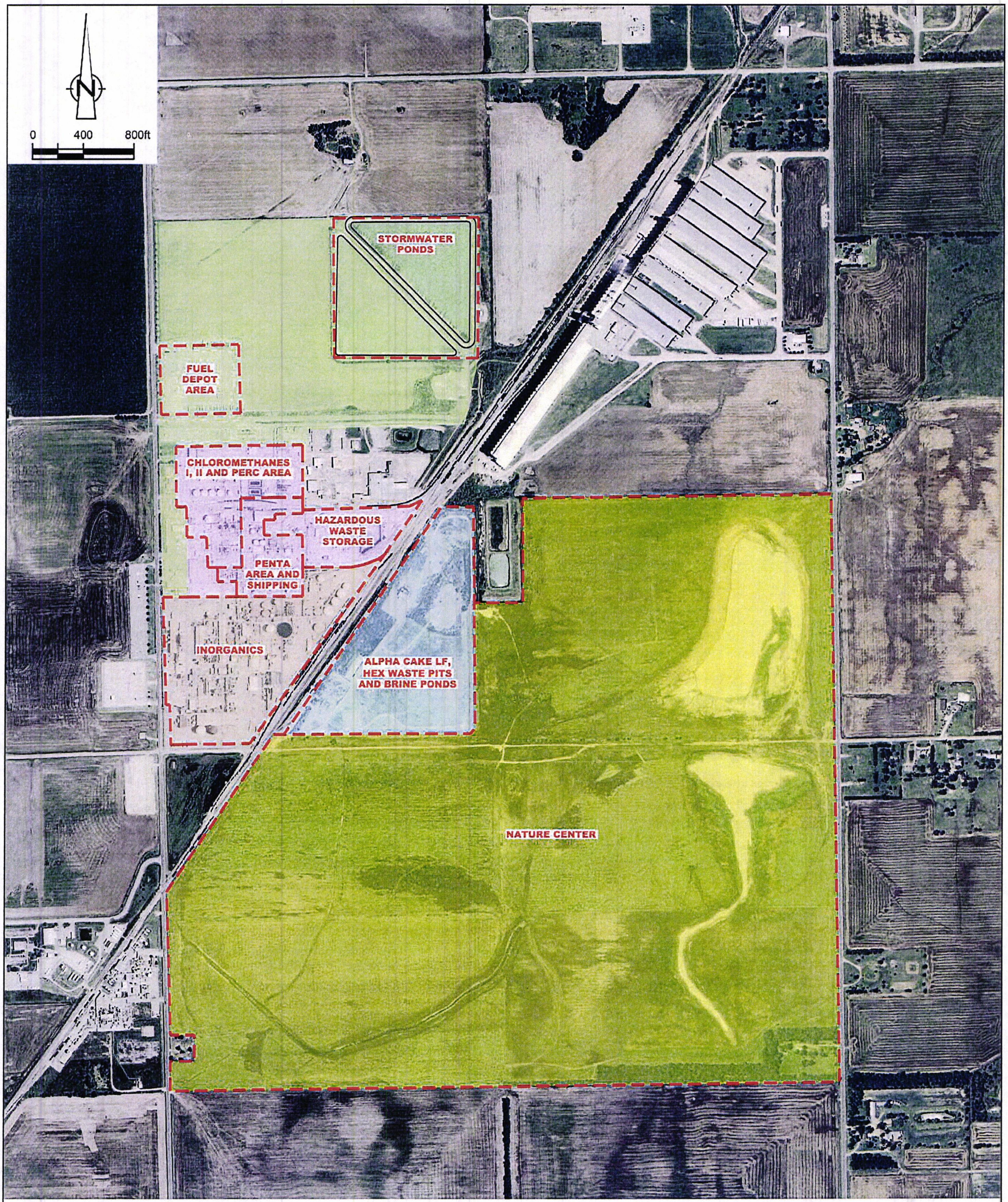
Carbon tetrachloride
Chloroform
Perchloroethylene
Hexachlorobenzene
Hexachlorobutadiene
Hexachloroethane
Pentachlorophenol
Other Organics

Pie charts indicating the mass percentage of analytes present in soil samples where at least one compound exceeded its soil saturation limit

Not to Scale

figure 25
CARBON TETRACHLORIDE AND PERCHLOROETHYLENE DNAPL AREA
OCCIDENTAL CHEMICAL CORPORATION
Wichita, Kansas

054046(047)GIS-CO001



LEGEND:

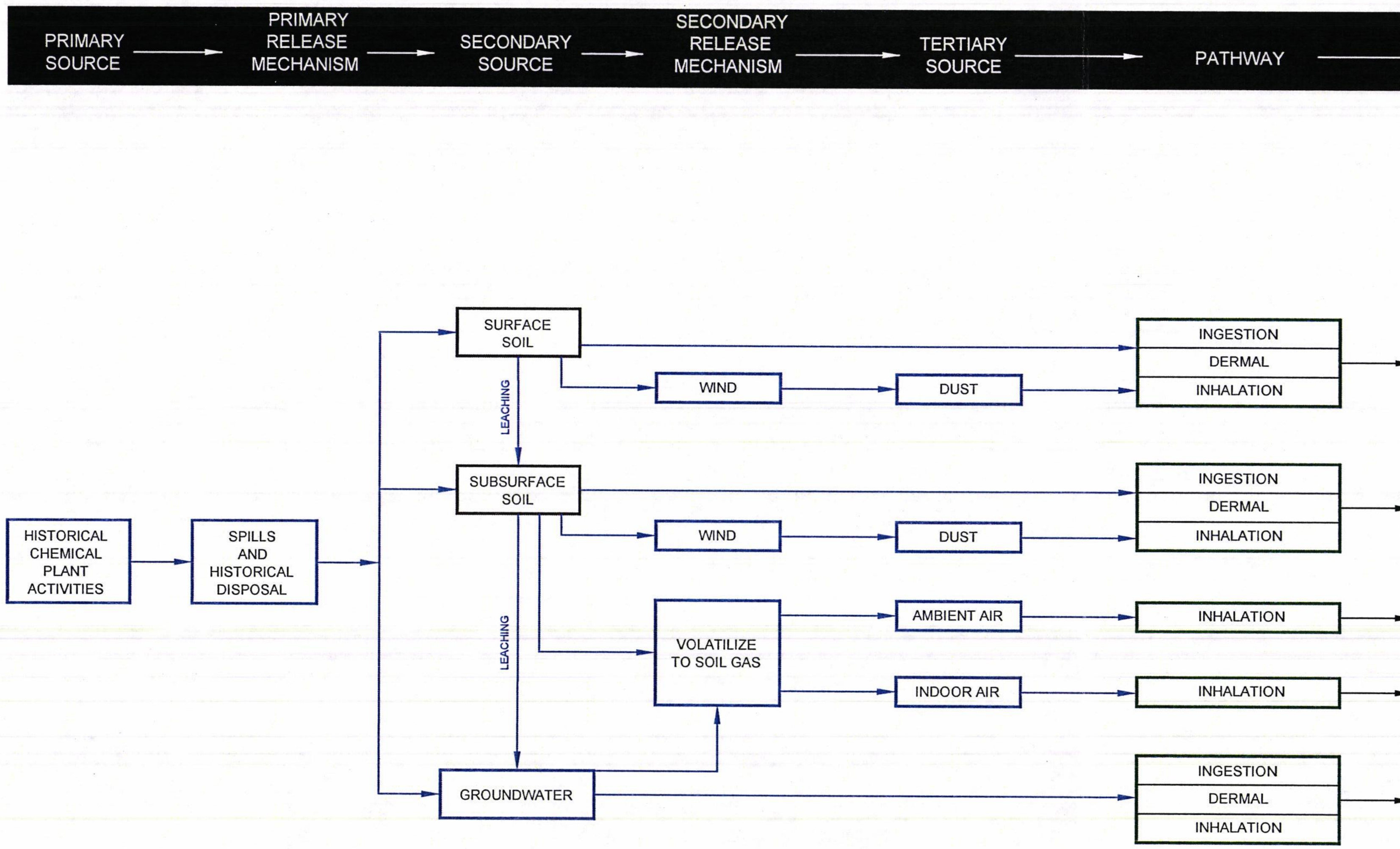
AREA OF INTEREST BOUNDARY
NON-PROCESS AREA
ORGANIC AREA
INORGANIC AREA
LANDFILL AREA
NATURE CENTER

figure 26

EXPOSURE AREAS
OCCIDENTIAL CHEMICAL CORPORATION
Wichita, Kansas

CRA

54046-D22105(047)GN-CO022 JUN 19/2014



Source / Pathway	On-site (1): Industrial / Commercial Worker	On-site (1): Construction / Utility Worker	On-site (1): Trespasser	On-site (1): Maintenance Worker	Off-site (1): Resident	Off-site (1): Recreational User
Surface soil – Ingestion	▲	▲	⊠	▲	♦	♦
Surface soil – Dermal	▲	▲	⊠	▲	♦	♦
Surface soil – Inhalation	▲	▲	⊠	▲	♦	♦
Subsurface soil – Ingestion	–	▲	–	–	–	–
Subsurface soil – Dermal	–	▲	–	–	–	–
Subsurface soil – Inhalation	–	▲	–	–	–	–
Ambient air – Inhalation	●	●	●	●	●	●
Indoor air – Inhalation	▲	–	–	–	♦	–
Groundwater – Ingestion	▲	–	–	–	♦	–
Groundwater – Dermal	▲	–	–	–	♦	–
Groundwater – Inhalation	▲	–	–	–	♦	–

LEGEND

- – PATHWAY IS NOT COMPLETE; NO EVALUATION REQUIRED
- → POTENTIAL EXPOSURE PATHWAY
- ▲ PATHWAY IS OR MIGHT BE COMPLETE AND COULD BE SIGNIFICANT; QUANTITATIVE EVALUATION
- ● PATHWAY IS OR MIGHT BE COMPLETE; QUALITATIVE EVALUATION
- ⊠ PATHWAY IS NOT LIKELY COMPLETE; QUANTITATIVE EVALUATION
- ♦ PATHWAY IS NOT LIKELY COMPLETE; QUALITATIVE EVALUATION

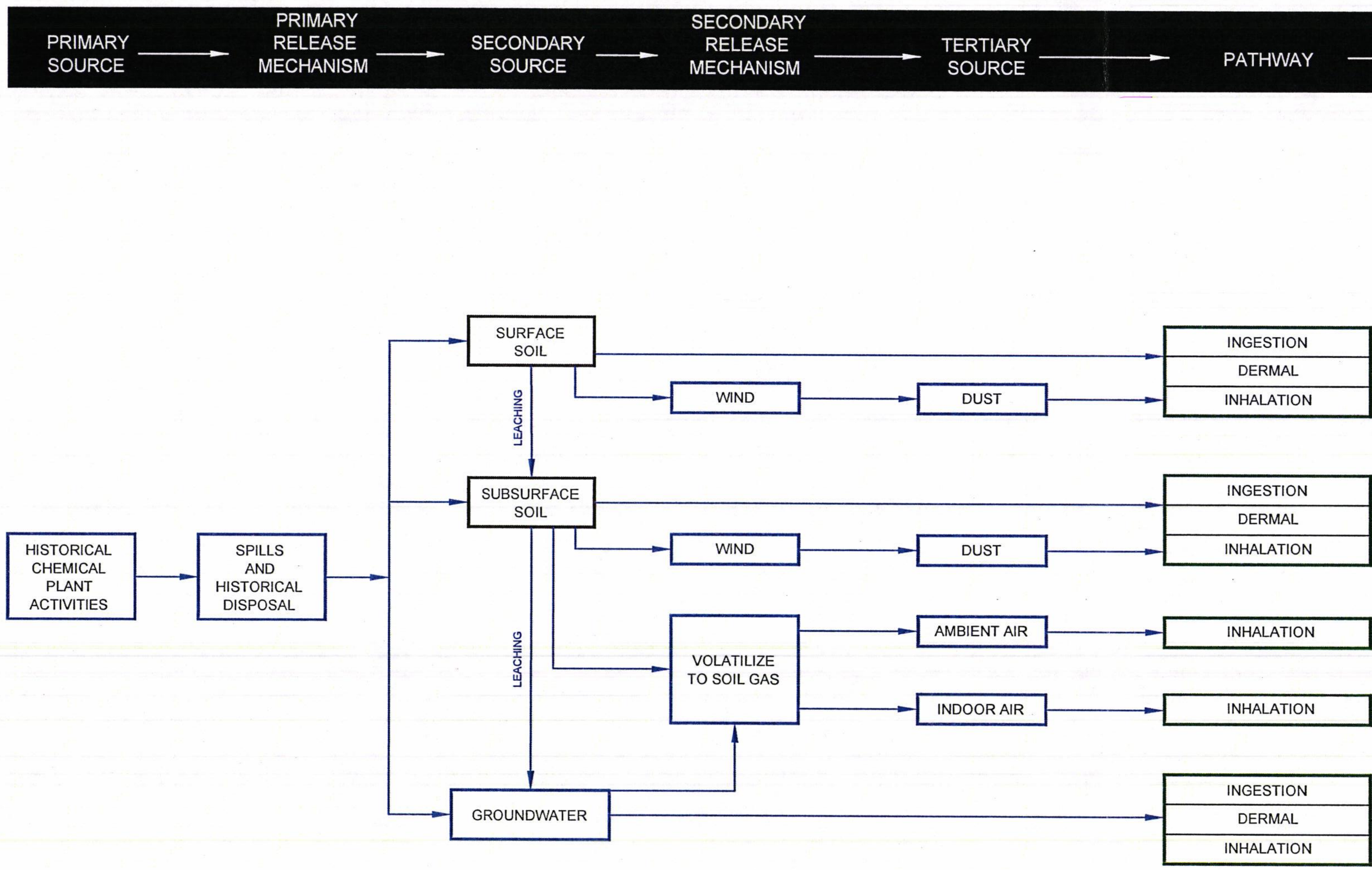
NOTE

(1) FOR THE PURPOSES OF THIS CONCEPTUAL SITE MODEL "SITE" HAS BEEN DEFINED AS THE EXPOSURE AREA

figure 27

HUMAN HEALTH CONCEPTUAL SITE MODEL
INORGANIC AND ORGANIC EXPOSURE AREAS
Occidental Chemical Corporation, Wichita, Kansas

54046-D21124(047)GN-WA001 JUN 19/2014



	RECEPTORS					
	ON-SITE (1)				OFF-SITE (1)	
Pathway	INDUSTRIAL / COMMERCIAL WORKER	CONSTRUCTION / UTILITY WORKER	TRESPASSER	MAINTENANCE WORKER	RESIDENT	RECREATIONAL USER
Surface soil – Ingestion	▲	▲	▲	▲	♦	♦
Surface soil – Dermal	▲	▲	▲	▲	♦	♦
Surface soil – Inhalation	▲	▲	▲	▲	♦	♦
Subsurface soil – Ingestion	–	▲	–	–	–	–
Subsurface soil – Dermal	–	▲	–	–	–	–
Subsurface soil – Inhalation	–	▲	–	–	–	–
Ambient air – Inhalation	●	●	●	●	●	●
Indoor air – Inhalation	▲	–	–	–	♦	–
Groundwater – Ingestion	▲	–	–	–	♦	–
Groundwater – Dermal	▲	–	–	–	♦	–
Groundwater – Inhalation	▲	–	–	–	♦	–

LEGEND

- – PATHWAY IS NOT COMPLETE; NO EVALUATION REQUIRED
- → POTENTIAL EXPOSURE PATHWAY
- ▲ PATHWAY IS OR MIGHT BE COMPLETE AND COULD BE SIGNIFICANT; QUANTITATIVE EVALUATION
- ● PATHWAY IS OR MIGHT BE COMPLETE; QUALITATIVE EVALUATION
- ♦ PATHWAY IS NOT LIKELY COMPLETE; QUALITATIVE EVALUATION

NOTE

(1) FOR THE PURPOSES OF THIS CONCEPTUAL SITE MODEL "SITE" HAS BEEN DEFINED AS THE EXPOSURE AREA

figure 28

HUMAN HEALTH CONCEPTUAL SITE MODEL
NON-PROCESS EXPOSURE AREA
Occidental Chemical Corporation, Wichita, Kansas

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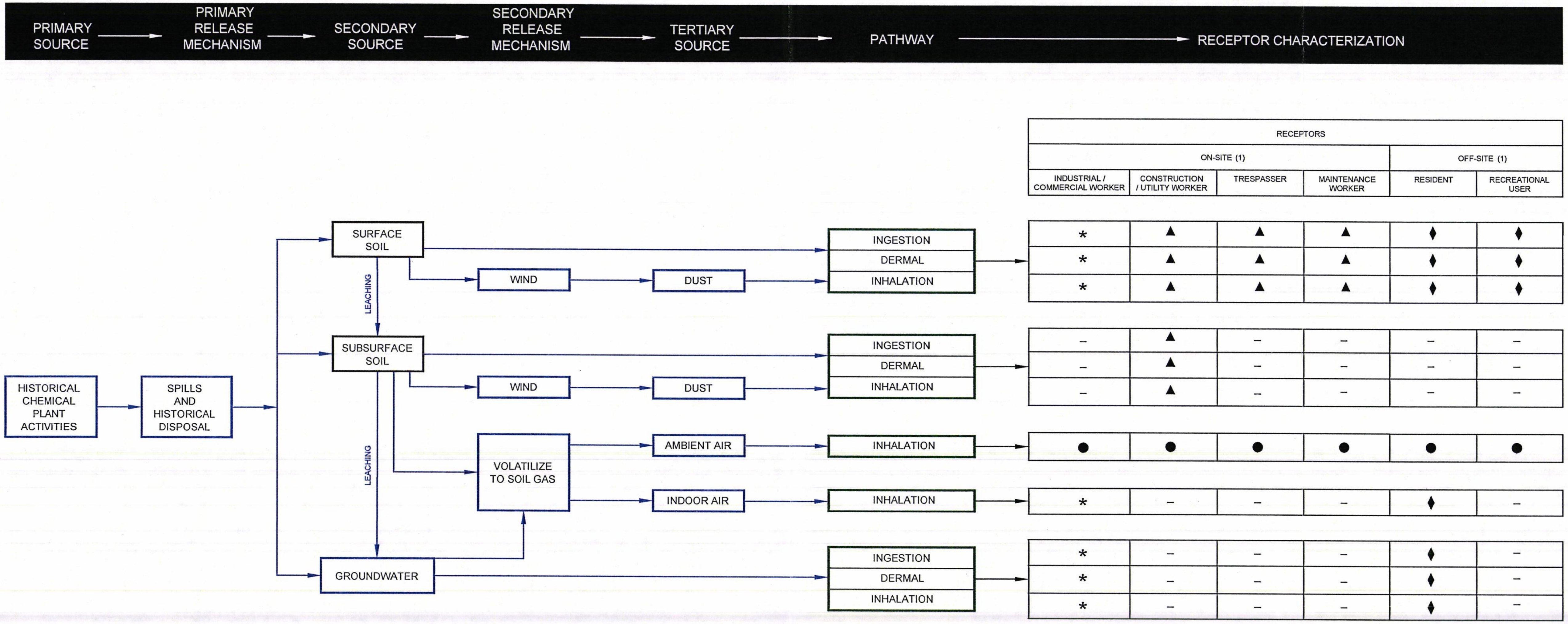
54046-D21124(047)GN-WA002 JUN 19/2014



LEGEND

- – PATHWAY IS NOT COMPLETE; NO EVALUATION REQUIRED
- → POTENTIAL EXPOSURE PATHWAY
- ▲ PATHWAY IS OR MIGHT BE COMPLETE AND COULD BE SIGNIFICANT; QUANTITATIVE EVALUATION
- ● PATHWAY IS OR MIGHT BE COMPLETE; QUALITATIVE EVALUATION
- * PATHWAY IS NOT LIKELY COMPLETE; QUALITATIVE EVALUATION
- ⧫ PATHWAY IS NOT LIKELY COMPLETE; QUALITATIVE EVALUATION

NOTE

(1) FOR THE PURPOSES OF THIS CONCEPTUAL SITE MODEL "SITE" HAS BEEN DEFINED AS THE EXPOSURE AREA

figure 29

HUMAN HEALTH CONCEPTUAL SITE MODEL
LANDFILL EXPOSURE AREA

Occidental Chemical Corporation, Wichita, Kansas

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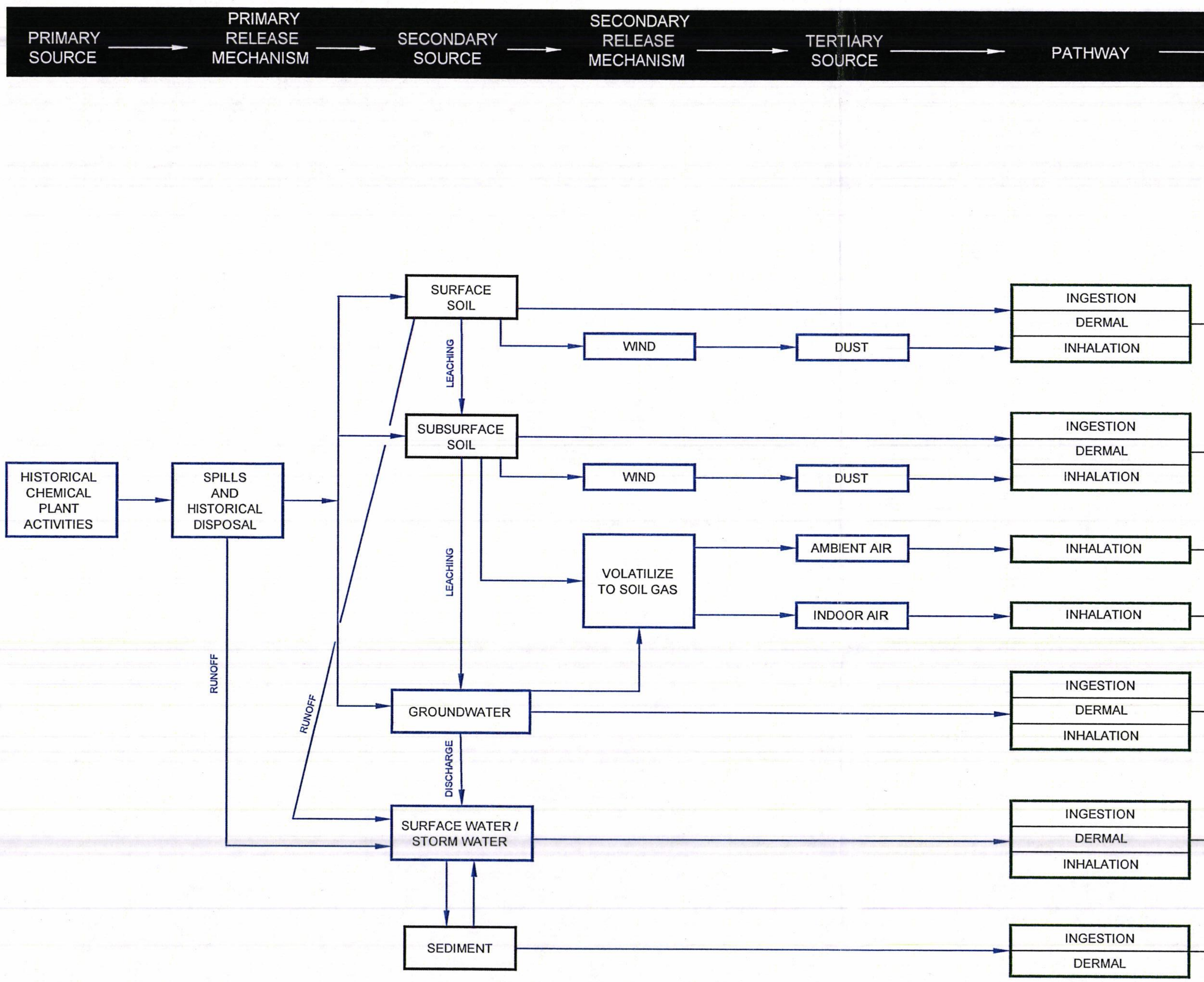
54046-D21124(047)GN-WA003 JUN 19/2014



Pathway		On-Site (1): Recreational User/ Trespasser (2)	On-Site (1): Maintenance Worker	Off-Site (1): Resident	Off-Site (1): Recreational User
Surface Soil	Ingestion	▲	▲	–	–
	Dermal	▲	▲	–	–
	Inhalation (Wind/Dust)	▲	▲	–	–
Subsurface Soil	Ingestion	–	▲	–	–
	Dermal	–	▲	–	–
	Inhalation (Wind/Dust)	–	▲	–	–
Ambient Air	Inhalation	●	●	●	●
Indoor Air	Inhalation	–	–	⧫	–
Groundwater	Ingestion	–	–	⧫	–
	Dermal	–	–	⧫	–
	Inhalation	–	–	⧫	–
Surface Water / Storm Water	Ingestion	▲	▲	–	⧫
	Dermal	▲	▲	–	⧫
	Inhalation	–	–	–	–
Sediment	Ingestion	▲	▲	–	⧫
	Dermal	▲	▲	–	⧫

LEGEND

- – PATHWAY IS NOT COMPLETE; NO EVALUATION REQUIRED
- → POTENTIAL EXPOSURE PATHWAY
- ▲ PATHWAY IS OR MIGHT BE COMPLETE AND COULD BE SIGNIFICANT; QUANTITATIVE EVALUATION
- ● PATHWAY IS OR MIGHT BE COMPLETE; QUALITATIVE EVALUATION
- ⧫ PATHWAY IS NOT LIKELY COMPLETE; QUALITATIVE EVALUATION

NOTE

(1) FOR THE PURPOSES OF THIS CONCEPTUAL SITE MODEL "SITE" HAS BEEN DEFINED AS THE EXPOSURE AREA
(2) RECREATIONAL USER AND TRESPASSER ASSUMED TO HAVE SIMILAR SHORT-TERM EXPOSURES

figure 30

HUMAN HEALTH CONCEPTUAL SITE MODEL
NATURE CENTER EXPOSURE AREA
Occidental Chemical Corporation, Wichita, Kansas

CRA

54046-D21124(047)GN-WA004 JUN 19/2014

TABLE 1

SWMU AND AOC EVALUATION SUMMARY
OCCIDENTAL CHEMICAL CORPORATION
WICHITA, KANSAS

AOI	AOC/SWMU Designation	Detailed Evaluation Result
CLM	Ancillary Piping	--
CLM	Hex Holding Tank	--
CLM	Hex Oxidizer	--
CLM	Hex Pot	--
CLM	Scrubber Tower	--
CLM	Waste Heat Boiler	--
CLM	Accumulation Storage Area - PCE	--
CLM	Accumulation Storage Area - Vulcan Feedstock (VFS)	--
CLM	Chloromethanes I Accumulation Storage Area	--
CLM	Chloromethanes II Accumulation Storage Area	--
CLM	Former Air Stripper/Acid Scrubber	--
CLM	Former Interceptor Well No. 22	--
CLM	Former Northwest Hex Waste Quench Pit (proposed SWMU)	R
CLM	Former Sump 405	--
CLM	Former Sump 408	--
CLM	Former Sump 503	--
CLM	Former Tank 420	--
CLM	Former Tank 503	--
CLM	Hazardous Waste Container Storage - R&D	--
CLM	Hex Incinerator	--
CLM	LP-2	--
CLM	LP-3	--
CLM	Sump 406	--
CLM	Sump 407	--
CLM	Sump 409	--
CLM	Sump 410	--
CLM	Sump 418	--
CLM	Sump 419	--
CLM	Sump 420	--
CLM	Sump 473	--
CLM	Sump 501	--
CLM	Sump 502	--
CLM	Sump 504	--
CLM	Sump 505	--
CLM	Sump 506	--
CLM	Tank 406	--
CLM	Tank 504	--
Hazwaste	Basin No. 2	NFA
Hazwaste	DDF Tank No. 7	--
Hazwaste	DDF Tank No. 8	--
Hazwaste	DDF Tank No. 9	--
Hazwaste	DDF Tank VS-57210A	--
Hazwaste	DDF Tank VS-57210B	--
Hazwaste	Deep Disposal Well No. 7	--
Hazwaste	Deep Disposal Well No. 9	--
Hazwaste	Drainage Ditch - Middle	--
Hazwaste	Former Deep Disposal Well No. 1	--
Hazwaste	Former Deep Disposal Well No. 2	--
Hazwaste	Former Deep Disposal Well No. 4	--
Hazwaste	Former Deep Disposal Well No. 6	--
Hazwaste	Former Hex Pit Area	R
Hazwaste	Former Sump 414	--
Hazwaste	Former Sump 415	--
Hazwaste	Former Sump 438	--
Hazwaste	Former Tank 415	--
Hazwaste	Hazardous Waste Storage - Solid Waste Container	--
Hazwaste	Hazardous Waste Container Storage - Penta	--
Hazwaste	Hazardous Waste Container Storage <90 Day Storage	--
Hazwaste	LP-1	--
Hazwaste	Sump 417	--
Hazwaste	Surge Tank 437	--
Hazwaste	Tank 416	--
Penta	Accumulation Storage Area - Shipping	NFA
Penta	Deep Disposal Well No. 8	--
Penta	Former Sump 422	--
Penta	Former Sump 423	--
Penta	Former Sump 428	--
Penta	Former Sump 430	--
Penta	Former Tank 424	--
Penta	Former Tank 426	--
Penta	Penta Accumulation Storage Area	R
Penta	Sump 411	--
Penta	Sump 412	UE
Penta	Sump 413	--
Penta	Sump 424	--
Penta	Sump 425	R
Penta	Sump 426	--
Penta	Sump 427	--
Penta	Sump 429	R
Penta	Sump 432	--
Penta	Sump 433	--
Penta	Sump 434	NFA
Penta	Sump 435	--
Penta	Sump 436	--
Penta	Sump 445	--
Penta	Sump 507	--
Penta	Tank 38	--

Area	AOI	AOC/SWMU Designation	Detailed Evaluation Result
Northern Area	Buildings	Former Interceptor Well No. 28	--
Northern Area	Buildings	R&D Hazardous Waste Tank - North Basement	--
Northern Area	Buildings	R&D Hazardous Waste Tank - Pilot Plant	--
Northern Area	Buildings	R&D Hazardous Waste Tank - South Basement	--
Northern Area	Fuel Depot	Fuel Depot Area	--
Northern Area	North area	Deep Disposal Well No. 10	--
Northern Area	North area	Deep Disposal Well No. 10 Headtank	--
Northern Area	North area	Deep Disposal Well No. 11	--
Northern Area	North area	Drainage Ditch - North	--
Northern Area	SW Ponds	Stormwater Ponds	
Inorganics Area	Inorganics	Asbestos Surface Impoundment	D
Inorganics Area	Inorganics	Basin No. 3	--
Inorganics Area	Inorganics	Cell Repair Sump	I
Inorganics Area	Inorganics	Deep Disposal Well No. 3	--
Inorganics Area	Inorganics	Drainage Ditch - South	--
Inorganics Area	Inorganics	Former D-2 Surge Tank	--
Inorganics Area	Inorganics	Former Solar Pond	--
Inorganics Area	Inorganics	Former Sump 448	--
Inorganics Area	Inorganics	Former Sump 449	--
Inorganics Area	Inorganics	Former Sump 451	--
Inorganics Area	Inorganics	Former Sump 455	--
Inorganics Area	Inorganics	Former Sump 458	--
Inorganics Area	Inorganics	Former Sump 464	--
Inorganics Area	Inorganics	Former Sump 465	--
Inorganics Area	Inorganics	Former Sump 484	--
Inorganics Area	Inorganics	Former Tank 6656	--
Inorganics Area	Inorganics	Interceptor Well No. 29	--†
Inorganics Area	Inorganics	Interceptor Well No. 35A	--†
Inorganics Area	Inorganics	Interceptor Well No. 35B	--†
Inorganics Area	Inorganics	Sump 17954	--
Inorganics Area	Inorganics	Sump 439	--
Inorganics Area	Inorganics	Sump 441	--
Inorganics Area	Inorganics	Sump 443	--
Inorganics Area	Inorganics	Sump 444	--
Inorganics Area	Inorganics	Sump 446	UE
Inorganics Area	Inorganics	Sump 447	--
Inorganics Area	Inorganics	Sump 450	--
Inorganics Area	Inorganics	Sump 452	--
Inorganics Area	Inorganics	Sump 453	--
Inorganics Area	Inorganics	Sump 454	--
Inorganics Area	Inorganics	Sump 456	--
Inorganics Area	Inorganics	Sump 457	--
Inorganics Area	Inorganics	Sump 459	--
Inorganics Area	Inorganics	Sump 460	--
Inorganics Area	Inorganics	Sump 461	--
Inorganics Area	Inorganics	Sump 462	--
Inorganics Area	Inorganics	Sump 463	--
Inorganics Area	Inorganics	Sump 466	--
Inorganics Area	Inorganics	Sump 467	--
Inorganics Area	Inorganics	Sump 468	--
Inorganics Area	Inorganics	Sump 470	--
Inorganics Area	Inorganics	Sump 477	--
Inorganics Area	Inorganics	Sump 478	UE
Inorganics Area	Inorganics	Sump 479	--
Inorganics Area	Inorganics	Sump 480	--
Inorganics Area	Inorganics	Sump 481	--
Inorganics Area	Inorganics	Sump 482	--
Inorganics Area	Inorganics	Sump 483	--
Inorganics Area	Inorganics	Sump 90083	--
Inorganics Area	Inorganics	Sump 90294	--
Inorganics Area	Inorganics	Waste Asbestos Handling	--
Landfill Area	Landfill	Alpha Cake Landfill	D
Landfill Area	Landfill	Brine Ponds	D
Landfill Area	Landfill	Former Interceptor Well No. 26	--†
Landfill Area	Landfill	Former Interceptor Well No. 32 (old)	--†
Landfill Area	Landfill	Former Interceptor Well No. 33	--†
Landfill Area	Landfill	Former Interceptor Well No. 34	--†
Landfill Area	Landfill	Former Interceptor Well No. 35	--†
Landfill Area	Landfill	Former Sump 469	--†
Landfill Area	Landfill	Hex Waste Pits	D
Landfill Area	Landfill	Interceptor Well No. 30	--†
Landfill Area	Landfill	Interceptor Well No. 31	--†
Landfill Area	Landfill	Interceptor Well No. 32 (new)	--†
Northern Area, Organic Area, Inorganic Area	Various	All Railroad Tracks in Process Areas and RR Corridor North to South	R
Organic Area, Inorganics Area	Various	Abandoned Piping (underground)	I

Notes

NFA - No further action recommended based on detailed evaluation

I - Inconclusive result

R - Indications of a release

D - Disposal Areas

UE - Soil exceedence unrelated to the AOC/SWMU

-- - Indicates no soil samples exceeded area background

† - indicates that no soil sample was collected adjacent to the AOC/SWMU. Samples were not required under the RFI work plans to evaluate these SWMUs because they are simple conveyances rather than waste management locations.